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The National Bill for Diseases Treated in U.S. Hospitals: 1987

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Research Note

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Abstract

This Research Note provides national estimates of charges and discharges for diseases treated in short-stay, general-service, non-Federal hospitals in the United States in 1987. Diagnoses are grouped by 185 summary diagnosis categories that are part of the Clinical Classifications for Health Policy Research, developed specifically by the Agency for Health Care Policy and Research (AHCPR). Diagnoses are ranked from highest to lowest in terms of hospital charges for discharges of a given type. The estimates and ranks are provided for all payers and separately for three payer subgroups: Medicare, Medicaid, and private insurance. Total charges in 1987 for hospitalizations in short-stay, general-service, non-Federal hospitals were estimated at $144.9 billion. Ischemic heart disease was the highest costing diagnosis category at $8.9 billion. Three other diseases of the circulatory system were among the top 10 costliest conditions (cerebrovascular disease, acute myocardial infarction, and congestive heart failure). These statistics were developed for setting AHCPR priorities on medical effectiveness research. These data will also serve health care policymakers, analysts, and program planners who need information on the cost of specific diseases for designing and analyzing policies and programs.

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Background

Research Notes are derived from research conducted by staff of the Division of Provider Studies (DPS), Center for General Health Services Intramural Research, Agency for Health Care Policy and Research (AHCPR). This note series provides results of analyses on health policy issues important to the Nation's hospitals.

Overview

The major goal of DPS, formerly the Hospital Studies Program, is to understand patterns of hospital behavior, use, and costs—particularly how hospitals are affected by changes in health policies and by innovations in the health care industry. The scope of the program covers both national health policy and local issues that influence major segments of the U.S. hospital market. The national and State databases maintained by DPS can be used for a variety of studies. Some important current issues that can be explored with these data include:

- Effects of major changes in Federal reimbursement policy on hospital behavior, such as numbers of admissions, length of stay, casemix, and profit.
- Results of innovations within the hospital industry, such as the growth of health maintenance organizations and preferred provider organizations, the introduction and diffusion of medical technologies, and the development of hospital alliances.
- Behavioral differences between key groups of hospitals, such as rural and urban, public and private, and teaching and nonteaching.
- Variations in casemix, severity of illness, and medical practice across geographic regions, hospitals, payers, and types of physicians.
- Resource consumption of patients hospitalized for medical conditions of particular policy interest, such as acquired immunodeficiency syndrome (AIDS) and other human immunodeficiency virus (HIV)-related illnesses, Alzheimer's disease, and extreme immaturity among newborns.

The above examples do not exhaust the issues that can be addressed with the DPS databases. DPS staff consult with industry experts, public officials, and other researchers in selecting topics for study.

DPS Databases

Three major databases support the research of DPS: (1) the Hospital Cost and Utilization Project (HCUP), a national sample of more than 500 hospitals; (2) the Hospital Cost and Clinical Research Project (HCCRP), a sample of 46 hospitals that enroll patients in clinical trials under the auspices of the National Cancer Institute (NCI); and (3) the State Hospital Data Project (SHDP), a collection of publicly available discharge data sets for hospitals in California, Florida, Maryland, New York, Massachusetts, Vermont, and Wisconsin. The HCUP hospitals were selected according to stratified sampling procedures and provide the basis for national studies of hospital behavior, utilization, and costs. The HCCRP hospitals were sampled by geographic region and type of NCI clinical-trials program to assess differences in the cost of caring for patients in clinical trials versus patients receiving conventional treatments for cancer. SHDP data were collected by State agencies or data centers from all hospitals within their jurisdictions.

Each project is built around a core of hospital discharge abstracts that provide data on inpatient stays. For HCUP and HCCRP, the abstracts are obtained from discharge abstracting companies or directly from hospitals that have their own in-house data processing systems; participating hospitals supplied all discharge abstracts rather than a sample of records. For SHDP, abstracts are obtained directly from the State agencies or data centers. In addition, each project assembles data on hospitals and local communities from a variety of sources. The American Hospital Association (AHA) has provided data since 1970 from its Annual Survey of Hospitals and various special surveys. All three projects also use county-level statistics obtained from the Area Resource File, compiled by the Health Resources and Services Administration's (HRSA's) Bureau of Health Professions.

Participation in HCUP and HCCRP was voluntary, and about half of sampled hospitals agreed to contribute their data. HCUP data, about 58 million records, cover 1970-77 (HCUP-1) and 1980-87 (HCUP-2). The 5 million HCCRP discharges cover 1980-85. SHDP includes discharges from hospitals in the seven States currently in the project, about

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40 million records. Years of data availability vary by State.

For the 1970-77 HCUP-1 sample, financial data were assembled from hospitals' annual Medicare Cost Reports. For the 1980-87 HCUP-2 sample, hospitals authorized release of their financial data from the confidential section of the AHA Annual Survey. The HCUP database also incorporates physician biographical information from the American Medical Association's (AMA's) Masterfile of U.S. Physicians, thus permitting a unique linkage among inpatient records, hospital data, and physician characteristics for about 160 hospitals.

The HCCRP database combines information on patients placed on protocols for new cancer treatments with discharge abstract data so that differences in charges for protocol and nonprotocol patients can be determined and analyzed. Twenty-five data processing centers provided these protocol data sets for NCI.

The DPS databases allow a variety of studies to be conducted both across types of hospitals and across time. Studies that are national in scope require the HCUP data. State data can be used to study small-area variations and the hospital market. These databases, augmented by the latest available information, permit comprehensive assessment of factors affecting patterns of hospital use and costs.

Acknowledgments

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AHCPR contracting arrangements and data confidentiality safeguards preclude the identification of individual hospitals, physicians, or their patients. DPS cannot acknowledge individually the contributions they have made to this research; but without such cooperation, the empirical research published by DPS since 1982 would not have been possible.

AHCPR thanks the following discharge abstracting companies for their timely contributions: Commission on Professional and Hospital Activities, Ann Arbor, MI; McDonnell Douglas Health Information Systems Co., Hazelwood, MO; Health Data Service of Maryland (a subsidiary of Blue Cross and Blue Shield of Maryland), Towson, MD; ServiShare of Iowa, Des Moines, IA; Hospital Utilization Project, Monroeville, PA; Quadax, Inc., Cleveland, OH; Utilization Information Service/Massachusetts Hospital Association, Burlington, MA; Utilization Information Service/Hospital Association of New York State, Albany, NY; Hospital Industry Data Institute, Jefferson City, MO; Shared Medical Systems, Malvern, PA; Commonwealth Clinical Systems, Charlottesville, VA; Infomed Associates, Inc./Rochester Area Hospitals Corp., Rochester, NY; MicroDecision Systems at the Center for Health Affairs, Princeton, NJ; MEDIX/Blue Cross of New Jersey, Florham Park, NJ; Kansas Health Data System/Blue Cross and Blue Shield of Kansas, Topeka, KS; and CHIP of Georgia/Blue Cross and Blue Shield of Georgia, Columbus, GA. In every case, these organizations released discharge abstract data only with the written authorization of the hospitals in the HCUP and HCCRP samples. To protect the confidentiality of participating hospitals, data were sent directly to a data processing contractor. All identifying information was removed from files prior to their receipt by AHCPR. In all cases, data were provided with the understanding that analyses, interpretations, and conclusions would be the sole responsibility of AHCPR.

AHCPR also acknowledges the generous provision of discharge abstract data from State agencies and/or their data processing centers, including the California Office of Statewide Health Planning and Development, Sacramento, CA; the Florida Health Care Cost Containment Board, Tallahassee, FL; the Maryland Health Services Cost Review Commission and the Information Service Center, Baltimore, MD; the New York State Department of Health, Statewide Planning and Research Cooperative System Bureau, Albany, NY; the Massachusetts Health Data Consortium, Inc., Waltham, MA; the State of Vermont, Agency of Human Services, Waterbury, VT; and the Wisconsin Office of Health Care Information, Madison, WI.

In addition to the extensive AHA and AMA data contributions discussed above, other hospital or program files were provided by the Office of Research and the Health Standards and Quality Bureau, HCFA; the Bureau of Health Professions, HRSA; the Association of American Medical Colleges; Abt Associates, Inc.; and the United Hospital Fund.

Several organizations generously shared with DPS the software they developed. They include SysteMetrics, Inc.; Health Systems International; the Health Care Research Department, Blue Cross of Western Pennsylvania; the Commission on Professional and Hospital Activities; the Institute for Health Policy Studies, University of California at San Francisco; and the School of Organization and Management, Yale University.

Data files for HCUP and HCCRP were constructed under the technical direction of AHCPR by SysteMetrics, Inc., Santa Barbara, CA. Data file construction for SHDP and programming support for DPS researchers are provided by Social and Scientific Systems, Inc., Bethesda, MD.

Programming support for this publication was provided by Leif Karell and Hermann Liau of Social and Scientific Systems. The authors are grateful for the useful comments provided by AHCPR reviewers.

Additional information on DPS and its databases is available from the Division of Provider Studies, AHCPR, 2101 East Jefferson Street, Suite 500, Rockville, MD 20852; phone (301) 594-1410.

Copies of DPS publications are available from the AHCPR Publications Clearinghouse, P.O. Box 8547, Silver Spring, MD 20907; phone toll free 800-358-9295.

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The National Bill for Diseases Treated in U.S. Hospitals: 1987

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Background

The cost of health care services in the United States has soared despite concerted efforts over the past decade by both public and private payers to restrain them. This uncontrollable rise and increasing concerns about the large number of people without health insurance are the major reasons for the widespread calls for reform of the health care system.

One direction for change is driven by research that has revealed wide variations in medical practice (Wennberg and Gittelsohn, 1973; Wennberg, Freeman, and Culp, 1987), inappropriate use of medical treatments (Winslow et al., 1988), and proliferation of expensive high-technology procedures for treating common health problems (Scitovsky, 1985). These conditions have arisen, in large part, because the medical community is uncertain about what works best in treating many conditions. To remedy this, the Agency for Health Care Policy and Research (AHCPR) is leading the effort to study the effectiveness of treatments for specific medical conditions (Sullivan, 1991). Congress mandated AHCPR to select conditions for study that account for a large portion of spending under the Medicare and Medicaid programs, that affect a substantial portion of the recipients in these programs, and that are associated with wide variations in practice patterns and patient outcomes (Raskin and Maklan, 1991).

Information on the aggregate cost of health services in the United States and on who pays for those services has been available for decades. However, little information is available on the nationwide cost of treating specific types of diseases and disorders that affect the U.S. population. What information does exist is restricted in the scope of the populations included, and these estimates cannot be combined for a national estimate of spending on specific diseases because of missing subgroups and differing disease classifications.

The AHCPR Hospital Cost and Utilization Project (HCUP) is a source of nationwide, all-payer hospital charges that can be tabulated by specific diseases and disorders to rank conditions by the resources consumed in short-stay community hospitals. Three drawbacks of these hospital charges limit our ability to measure total health care spending with these data. First, hospital expenses capture less than one-half of what Americans spend on health care (Levit et al., 1991). Second, hospital charges are an overestimate of spending on hospital care: large payers negotiate discounts on those charges, so payment rates are less than charges (Latta and Keene, 1990). Third, Federal, specialty, and long-stay hospitals are all excluded from the HCUP database. Nevertheless, the acute care community hospital setting is where the largest single portion of the American health care dollar is spent, and billed charges can be used to rank the costliness of health conditions even though they do not provide a measure of total health care spending. Furthermore, hospital spending by disease can be estimated using information about the payment-to-charge ratio for each payer, as described later.

Purpose

This Research Note provides estimates of the national bill for screening, diagnosis, treatment, and aftercare for specific diseases and disorders in acute care community hospitals in the United States. The purpose of this report is to present statistics on hospital charges by diagnosis using a new diagnosis classification system developed for health policy research. The ultimate goal of this work is to provide a method for AHCPR to relate

its research funding decisions to the costliness of care for specific medical conditions in the United States.

Previous research

The data in this report fill a major gap in knowledge about the cost of medical care. There are no other published data on total U.S. hospital charges for diagnoses at the level of specificity used in this Research Note. Previous literature has estimated expenditures for 16 to 18 diagnosis groups, based on the chapters of the *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM) (Public Health Service and Health Care Financing Administration, 1980) for all U.S. hospitalizations (Hodgson and Kopstein, 1984) and reported expenditures for Medicaid recipients in three States (Pine, Howell, and Buczko, 1987). Average cost (or expenditure) per hospitalization is also available for the diagnosis-related groups (DRGs) of specific subgroups of the U.S. population, such as Medicare recipients (Health Care Financing Administration, 1991; Latta and Helbing, 1991); a selected group of individuals with private insurance coverage benefits from large self-insured employers (MEDSTAT Systems, 1991); and the populations of individual States (Ploeger-Dizon, 1988). This report is unique in providing national estimates of total charges for relatively specific groups of diagnoses for all payers and three major payer groups.

Method

Data source

The national estimates presented in this paper were generated from 3.6 million discharge abstracts for the year 1987 from the Hospital Cost and Utilization Project, 1980-87 (HCUP-2). Each record contains summary information on a patient's stay in the hospital, including diagnostic information. Abstract records were collected for all discharges from each HCUP-2 hospital.

The HCUP-2 hospital sample was designed to represent the universe of short-term, general-service, non-Federal hospitals in the United States with at least 30 beds. This universe included 5,050 of the 6,821 hospitals of all types in the United States in 1987. Using information from the 1982 Annual Survey of the American Hospital Association, the universe of hospitals was stratified for sample selection on the following five dimensions: geographic region (Northeast, North Central, West, and South); location/teaching status (rural, urban teaching, urban nonteaching); ownership (voluntary, public, investor-owned); extent of State regulation (mandatory, voluntary, none); and size of hospital by number of beds (small, medium, and large, with the number of beds in each category varied according to location/teaching status) (Coffey and Farley, 1988). In 1987, there were 465 hospitals in the HCUP-2 sample.

Clinical classifications

In this report, medical conditions are grouped by Clinical Classifications for Health Policy Research, which are aggregations of ICD-9-CM codes developed by AHCPR. The development of the Clinical Classifications for Health Policy Research is described in detail in a separate publication (Elixhauser, Andrews, and Fox, 1993). These classifications combine separately coded aspects of the same or similar conditions. This classification system was built to allow AHCPR to assess the relevance of its research portfolio and to make future funding decisions in the context of the cost of medical conditions.

The Clinical Classifications for Health Policy Research system has summary categories and detailed categories. The 185 summary diagnosis categories are used in this report; definitions of the categories are provided in Appendix A. These categories comprise an exhaustive, mutually exclusive system of ICD-9-CM codes that classify conditions into clinically homogeneous groups.

The categories were developed to be of a scope and clinical similarity that would make them helpful for selecting medical treatment effectiveness research topics based on total hospital charges. The individual three-, four-, and five-digit ICD-9-CM codes, consisting of more than 10,000 different codes, were far too specific. Even the approximately 900 ICD-9-CM codes at the three-digit level were not ideal because many conditions that are clinically similar have different three-digit codes. For example, normal delivery and live newborns have several different three-digit codes. In the summary diagnosis categories, these codes have been collapsed into one group—"normal delivery/liveborn."

The nearly 500 DRGs were not suitable for determining medical effectiveness research priorities because the groups are partially defined by the presence or absence of a procedure. Patients who are similar in terms of their clinical picture may, nonetheless, vary in whether they received a procedure, and the choice of whether to perform a procedure may be a focal point of medical effectiveness research. Therefore, a system that incorporates procedures into the definition of patient groups was not appropriate for this purpose.

The diagnosis categories employed here were not constructed to obtain estimates of the incidence or prevalence of conditions. Rather, the intent of the classification system was to assign all discharges to categories that were most likely to include all hospitalizations for a specific condition, regardless of whether the purpose of the stay was for screening, diagnosis, treatment, or aftercare. To accomplish this, a cost-of-illness approach was employed in assigning specific diagnosis codes. Any hospitalization in which the principal diagnosis dealt with a condition, broadly defined, was assigned to that condition category. In order to estimate total hospital charges for all hospitalizations in the United States, it was necessary to assign all discharges to specific diagnosis categories. A study focusing on just a few diagnostic conditions probably would involve a different assignment of diagnosis codes.

For example, in this study, the breast cancer category includes not only the specific ICD-9-CM codes for breast cancer (174-175) but also the code for abnormal mammogram (793.8). The intent of this analysis was to assign the hospital charges for which the principal diagnosis was "abnormal mammogram" to the most likely underlying condition or suspected condition, even if a definitive diagnosis of breast cancer was not reached. Another example is hypertension. This category includes the specific hypertension codes (401-405) as well as high blood pressure (796.2) and hypertension screening (V81.1). Nonspecific codes comprise a very small proportion of discharges and have a very small impact on the estimates. For example, 99.7 percent of all cases in the breast cancer category have a principal diagnosis of primary breast cancer or history of breast cancer, and the specific hypertension codes comprise more than 99.9 percent of discharges in the hypertension category.

Development of national estimates

National estimates of total dollar charges were developed in three steps: (1) the number of discharges for each diagnosis category was estimated, (2) the average charge by diagnosis was calculated, and (3) average charges and number of discharges were multiplied to obtain an estimate of the national bill for each diagnosis treated in U.S. hospitals. The first two steps required special adjustments to account for sampling and missing data.

Number of discharges. National estimates of the number of discharges were derived by applying sample weights to each discharge abstract in the 1987 HCUP-2 database. Sample weights were generated using the American Hospital Association (AHA) Annual Survey for 1987 and the HCUP-2 data for 1987. The universe of hospitals (short-term, general-service, non-Federal hospitals in the United States with at least 30 beds) and the HCUP-2 sample of hospitals were divided into strata using four of the five dimensions of the original sample design: geographic region, location/teaching status, ownership, and size. (The fifth dimension, extent of State regulation, was not included for defining strata for weight development.) The number of admissions (including newborns) reported in the 1987 AHA Annual Survey was used to compute the number of admissions for universe hospitals (N) and for HCUP-2 sample hospitals (n) by stratum (k). Weights for each stratum (W_k) are the ratio of the universe to the HCUP-2 admissions:

$$W_k = \frac{N_k}{n_k}$$

In some cases, sample strata existed for the universe of hospitals but were missing for the 1987 HCUP-2 hospitals. In these few cases, investor-owned or public hospitals were collapsed with voluntary hospitals having other strata characteristics in common.

An adjustment to the weights for specific hospitals was made when hospitals treated patients during a period but did not provide the project with abstracts for all patients discharged during that period. This reporting adjustment increased the hospital's weight to compensate for the missing months of data. For example, if a hospital was missing data for six months during the year, the hospital's sample weight would be twice the weight calculated for the stratum.

The final weight for each hospital was multiplied by each of its discharge records, and these weighted discharges were summed within diagnosis categories to develop national estimates of the number of discharges by diagnosis from the 1987 HCUP-2 database.

Average charge. The mean charge for each diagnosis stratum was calculated using records with no missing charges. If charges were missing for all or part of a hospital's discharges in a diagnosis category, records with charges in that diagnosis stratum were used to impute charges for the records without charges. If charges were missing for an entire diagnosis stratum, then diagnosis strata were aggregated to obtain a mean charge for the aggregated strata. Strata were aggregated first by size of hospital, then by location/teaching status, and then by region.

National hospital bill by disease. The diagnosis-stratum mean charge was multiplied by the diagnosis-stratum national number of discharges for each diagnosis-stratum group. Charges were summed across strata to yield the estimate of the national bill by disease for health conditions treated in U.S. hospitals.

Verification of estimates

Several sources were used to judge the accuracy of the national estimates for number of discharges and charges from HCUP-2 data. There is no single standard for comparison because there is no comprehensive national source of such data. The available data differ from HCUP-2 in terms of:

- Hospitals included (e.g., short-stay hospitals versus short-stay, general-service, non-Federal hospitals with at least 30 beds).
- Discharges included (e.g., patients employed by large firms versus all privately insured patients).
- Measures used (e.g., hospital expenses versus hospital charges).

Comparisons with other sources suggest that national estimates presented in this Research Note are reasonable. Appendix B provides those comparisons for charges and number of discharges and briefly describes how other sources differ from HCUP-2 in terms of measures and populations.

National cost estimates by payer

The reader can derive rough estimates of the national cost (rather than charges) of specific diseases for some payers by using rules of thumb about differences between charges and payments of specific payers. For example, the data in Appendix Table B-1 indicate that Medicare charges versus payments for short-stay inpatient hospital care were $68.490 billion versus $44.068 billion in 1987 (Latta and Keene, 1990). This implies a payment-to-charge ratio of 0.643. Multiplying this ratio by the HCUP-2 estimate of the national hospital bill for Medicare patients for a specific disease approximates the payment to hospitals for that disease. It is only an approximation because the payment-to-charge ratio varies across diseases and treatments, especially for Medicare, whose DRG payments are fixed for a year, and when technology is changing rapidly.

Cautions for using estimates

The tables in this Research Note provide estimates of hospital charges and numbers of discharges for screening, diagnosis, treatment, and aftercare for specific diseases. The following issues should be considered when interpreting the numbers:

- The numbers represent the universe of hospitals used to design the HCUP-2 sample—all short-term, general-service, non-Federal hospitals in the United States with at least 30 beds. The HCUP-2 sample does not include specialty hospitals such as psychiatric, cancer, rehabilitation, or children's hospitals.
- Billed charges usually exceed costs, expenditures, and reimbursed amounts.
- The charges in this report cover only services provided by the hospital during an inpatient hospital stay. They exclude professional services provided during the hospital stay but billed separately, and they exclude all preadmission and postdischarge care.
- Each hospitalization and its related hospital bill are attributed to the payer that the hospital expected to pay the major portion of the bill (the expected primary payer). The expected primary source of payment at admission may not be the ultimate primary payer. In addition, other (secondary) payers may pay a portion of the bill.

- The disease categories are based on principal diagnoses. The principal diagnosis is the diagnosis that the patient's physician, after study, determines to be the chief cause of the hospitalization. Secondary diagnoses of patients were not used in classifying or analyzing the data. Therefore, any charges relating to patients' secondary diagnoses are attributed to the principal diagnosis.
- The specific ICD-9-CM codes that make up a disease category (shown in Appendix A) should be consulted to determine the precise definition of the category, rather than relying solely on the general label provided for the category.
- The purpose of the statistics presented is to provide estimates of hospital charges for specific disease categories. Other uses of the statistics should be undertaken with caution. For example, the number of discharges for categories related to childbirth cannot be aggregated to estimate the number of births in U.S. general hospitals. The categories are a mixture of mother and baby discharges and in some categories (e.g., "complications of birth, puerperium") discharges within the category do not necessarily result in a birth during that hospitalization.
- A few estimates for individual disease categories within payer groups are based on fewer than 100 discharges in the HCUP-2 database. Because these estimates should be interpreted with caution, they are footnoted.

Results

Table 1 provides estimates of charges and the number of discharges from short-term, general-service, non-Federal hospitals in the United States with at least 30 beds in 1987. The total charges are $144.9 billion, and the number of discharges is 33.7 million.

These national estimates from HCUP-2 are compared with similar estimates from other sources in Appendix B. Although none of the estimates are directly comparable in terms of definitions or populations, the HCUP-2 estimates are reasonably close to other national figures. The comparisons are presented as a reference for judging the utility of the primary contribution of this work—information for ranking the costliness of specific illnesses.

Table 1 also includes estimates for 17 organ system/etiology groups. The 17 groups are aggregations of the 185 diagnosis categories described above and roughly correspond to the ICD-9-CM chapters. The most costly aggregated diagnosis group is diseases of the circulatory system, at $33.4 billion. This is more than twice the amount of the next most costly group, diseases of the digestive system.

Table 2 provides estimates of billed charges and the number of discharges for the 185 summary diagnosis categories. A small percentage of discharges (0.2 percent) are not classifiable within the categories because they have a principal diagnosis that is nonspecific (e.g., ICD-9-CM codes V16, family history of malignant neoplasm, and V47.9, other unspecified problems) or because they have invalid diagnosis codes. These discharges are grouped in the table as "unclassifiable diagnosis codes."

The diagnosis categories are listed in order of rank by total charges, with the costliest diagnosis first. The table also shows the rank by number of discharges. Four of the 10 costliest diagnosis categories are diseases of the circulatory system (ischemic heart disease, cerebrovascular disease, acute myocardial infarction, and congestive heart failure). Among the top 20 categories, 3 are pregnancy related (normal delivery and newborn, complications of birth and puerperium, and complications during pregnancy).

Related conditions can be further combined into more general categories, such as all respiratory cancers or renal failure. Table 3 presents some grouped categories of this kind.

Tables 4-6 show the same information as Table 2 for discharges with Medicare, Medicaid, and private insurance, respectively, as the expected primary payer. Estimated total billed charges were $63.93 billion for Medicare, $13.65 billion for Medicaid, and $50.31 billion for private insurance. The amounts for these three groups do not add to the total $144.9 billion because some discharges belong to other payer groups (e.g., covered by other government programs or uninsured).

Predictably, certain conditions are relatively more prominent in some payer groups than in others. For example, fracture of the neck of the femur (hip fracture) ranks 6th for Medicare, 49th for Medicaid, and 65th for privately insured discharges. Circulatory diseases account for 6 of the top 20 diagnosis categories for Medicare

discharges, reflecting the health conditions of the elderly.

Among Medicaid discharges, 4 of the top 10 diagnoses are for pregnancy-related conditions, and 3 of the top 20 are for conditions related to mental health. The frequency of these conditions is related to the two largest categories of persons with Medicaid as their primary payer for hospital care. The largest category is the Aid for Families With Dependent Children program, which has a heavy concentration of women of childbearing age. The second largest category is disabled persons in the Supplemental Security Income (SSI) program, among whom the most prominent disabling condition is mental disorder (Adams, Ellwood, and Pine, 1989).

The top 20 categories for the privately insured include 3 circulatory categories, 3 pregnancy-related categories, and 3 categories related to mental health. A category of conditions resulting in back pain ranks 7th for the privately insured, primarily an employed population, whereas it ranks 25th among Medicare and 37th among Medicaid discharges.

Discussion

Inpatient hospital services represent the single largest health service cost in the United States, comprising approximately 32 percent of annual expenditures for personal health care services in 1990 (Levit et al., 1991). Because inpatient hospital services are such an important component of health care costs, the estimates in this publication can be used to help set priorities for health care research and treatment. For example, comparing clinical conditions in terms of hospitalizations and hospital costs can help set priorities for research on the effectiveness of treatment for specific illnesses. Among clinical conditions for which there are varied treatment approaches with relatively uncertain outcomes, those conditions ranking high in frequency of hospital admissions or high in total hospital charges would be candidates for further research.

Indeed, as shown in Table 7, all but 1 of the first 14 AHCPR-sponsored Patient Outcomes Research Team (PORT) projects, comprehensive research projects on the effectiveness of treatment for specific illnesses, deal with conditions among the 25 most costly diagnoses for discharges with Medicare, Medicaid, or private insurance as the primary payer.

The estimates in this publication improve our understanding of how health care dollars are being spent. They can be used as a reference for researchers or policymakers who need information on total hospital charges for caring for specific diagnoses. For example, the data could be used to:

- Develop programs related to specific diagnoses.
- Estimate the impact of technological changes on costs of diseases.
- Predict or simulate the impact of prevention or early intervention programs for specific diseases.
- Provide baseline data for cost-of-illness studies and cost-benefit or cost-effectiveness analyses of alternative treatments for specific diseases.
- Assess the importance and potential costliness of health programs and policies targeted to specific illnesses.

Although these estimates of the Nation's hospital bill for specific health problems were developed to help set priorities in AHCPR's research program, they will have broad uses for public and private health policy decisions, especially as alternative approaches to health care reform are considered.

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Table 1
National billed charges and number of discharges for hospitalizations, by major diagnosis group, 1987—All payers

Medical condition	Billed charges in millions	Discharges in thousands
Total	**$144,879**	**33,713.4**
Infectious and parasitic diseases	2,965	491.7
Neoplasms	13,866	2,230.8
Endocrine, nutritional, and metabolic diseases and immunity disorders	3,806	876.5
Diseases of the blood and blood-forming organs	1,039	250.9
Mental disorders	7,397	1,536.8
Diseases of the nervous system and sense organs	3,553	967.8
Diseases of the circulatory system	33,435	5,425.7
Diseases of the respiratory system	12,611	2,692.1
Diseases of the digestive system	16,091	3,624.1
Diseases of the genitourinary system	8,712	2,294.5
Pregnancy, childbirth, and the puerperium	12,371	7,784.3
Diseases of the skin and subcutaneous tissue	2,082	420.0
Diseases of the musculoskeletal system and connective tissue	7,306	1,462.7
Congenital anomalies	890	149.9
Certain conditions originating in the perinatal period	1,024	111.2
Injury and poisoning	15,530	2,983.9
Other and cross-cutting conditions	2,204	410.5

Note: Data are for discharges from short-term, general, non-Federal hospitals with 30 beds or more.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Data from the Hospital Cost and Utilization Project.

Table 2
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—All payers

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
		Total	**$144,879**	**33,713.4**	—
1	84.	Ischemic heart disease	8,892	1,604.5	3
2	150.	Normal delivery/liveborn	5,461	4,383.1	1
3	90.	Cerebrovascular disease	5,090	816.1	6
4	100.	Pneumonia and influenza	5,050	886.6	5
5	149.	Complications of birth, puerperium	4,702	2,231.0	2
6	83.	Acute myocardial infarction	4,596	555.5	12
7	89.	Congestive heart failure	4,037	693.9	8
8	170.	Other fractures, not hip	3,972	779.1	7
9	175.	Complication of device or procedure	3,103	499.5	13
10	125.	Biliary tract disease	3,032	579.3	11
11	88.	Conduction disorders, dysrhythmias	2,578	496.3	14
12	161.	Spondylosis, intervertebral disc disorders, cervical disorders, other back pain	2,508	680.3	10
13	168.	Fracture of neck of femur (hip)	2,496	264.4	26
14	61.	Depression and affective disorders	2,307	455.0	15

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 2—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—All payers

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
15	101.	Other respiratory infections (not tuberculosis)	$2,026	681.7	9
16	160.	Osteoarthritis	1,998	206.0	39
17	46.	Diabetes mellitus	1,851	380.6	19
18	38.	Secondary malignancies	1,804	246.8	29
19	57.	Alcohol-related disorders	1,803	414.7	16
20	148.	Complications during pregnancy	1,696	912.7	4
21	12.	Cancer of colon-rectum	1,657	161.2	54
22	134.	Urinary tract infection	1,636	373.2	20
23	16.	Cancer of bronchus, lung, trachea, larynx	1,524	187.9	43
24	121.	Intestinal obstruction without hernia	1,423	214.5	37
25	2.	Septicemia	1,420	161.8	53
26	182.	Rehabilitation care and fitting of prostheses	1,359	95.0	88
27	103.	Asthma	1,304	408.3	17
28	102.	Chronic obstructive pulmonary disease and allied conditions	1,245	206.7	38
29	49.	Fluid and electrolyte disorders	1,222	328.1	23
30	92.	Aneurysm and disorders of arteries	1,218	89.0	93
31	151.	Skin and subcutaneous infections	1,209	298.5	24
32	40.	Maintenance chemotherapy, radiotherapy	1,204	381.7	18
33	172.	Intracranial injury (not fracture)	1,152	217.4	36
34	137.	Hyperplasia of prostate	1,101	286.2	25
35	107.	Other lower respiratory diseases	1,040	170.1	48
36	120.	Noninfectious enteritis and colitis	1,039	349.2	21
37	91.	Atherosclerosis (not heart or brain)	1,032	111.0	78
38	166.	Perinatal conditions	1,024	111.2	77
39	173.	Internal injury to viscera or vessels, crushing injury	1,003	106.6	81
40	122.	Diverticulosis and diverticulitis	995	165.1	51
41	117.	Appendicitis	936	236.4	31
42	135.	Calculus of urinary tract	928	343.9	22
43	127.	Pancreas disorders (not diabetes)	900	136.0	68
44	165.	Congenital anomalies	890	149.9	62
45	42.	Other benign neoplasms	850	180.7	44
46	93.	Peripheral arterial embolism	846	88.9	94
47	128.	Gastrointestinal hemorrhage	844	173.5	47
48	58.	Drug disorders, not alcohol related	816	150.6	61
49	59.	Schizophrenic disorders	803	165.8	49
50	86.	Other and ill-defined heart disease	786	101.0	82
51	73.	Epilepsy, convulsions	776	231.9	32
52	162.	Osteoporosis and other disorders of bone and cartilage	740	134.4	69
53	113.	Gastric ulcer	737	115.5	74
54	80.	Other nervous system disorders	736	143.7	65
55	174.	Open wounds	728	219.7	35
56	116.	Gastritis, upper gastrointestinal obstruction, nausea	713	230.4	33
57	143.	Menstrual disorders and ovarian cyst	691	227.2	34
58	114.	Duodenal ulcer	684	109.1	79
59	153.	Chronic ulcer of skin	684	66.5	106
60	41.	Benign neoplasm, uterus	679	176.4	45
61	178.	Poisoning	674	244.6	30
62	20.	Cancer of breast	651	162.7	52

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 2—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—All payers

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
63	136.	Other genitourinary disorders	$650	158.0	55
64	119.	Other abdominal hernia	649	152.2	57
65	129.	Other gastrointestinal disorders	645	96.3	87
66	96.	Thrombophlebitis and thromboembolism	639	151.3	59
67	82.	Hypertension	632	145.2	64
68	87.	Heart valve disorders	627	50.2	118
69	104.	Aspiration pneumonitis, food/vomitus	627	56.3	113
70	146.	Other female genital disorders	627	191.1	42
71	51.	Anemias	621	155.7	56
72	118.	Inguinal hernia	606	263.6	27
73	126.	Liver disease, not alcohol related	595	91.6	91
74	140.	Inflammation of female pelvic organs	587	175.5	46
75	105.	Pleurisy, pneumothorax, pulmonary collapse	582	145.5	63
76	133.	Chronic renal failure	578	55.6	114
77	35.	Leukemia	578	35.9	134
78	25.	Cancer of prostate	557	112.3	75
79	157.	Infective arthritis and osteomyelitis	550	58.9	111
80	85.	Diseases of pulmonary circulation	532	71.0	100
81	11.	Cancer of stomach and esophagus	526	39.1	128
82	171.	Sprains and strains	515	199.8	41
83	147.	Pregnancy with abortive outcome	511	257.5	28
84	142.	Prolapse of female genital organs	509	139.0	66
85	177.	Burns	484	53.5	116
86	167.	Joint disorders, trauma related	483	151.1	60
87	95.	Syncope	475	165.6	50
88	112.	Esophageal disorders	472	124.4	72
89	94.	Other circulatory disease	457	69.4	103
90	179.	Other external injury	446	137.2	67
91	130.	Abdominal pain	436	200.4	40
92	6.	Viral infections (not gastrointestinal or HIV)	435	151.3	58
93	106.	Respiratory failure/insufficiency (adult)	433	36.0	133
94	132.	Acute and unspecified renal failure	432	45.9	120
95	141.	Endometriosis	397	111.4	76
96	164.	Other muscle, bone, connective tissue disease	385	96.6	86
97	158.	Other joint disorders (not trauma)	381	131.0	70
98	27.	Cancer of bladder	379	75.5	97
99	81.	Acute and chronic rheumatic disease	378	27.9	146
100	39.	Neoplasms of unspecified site or uncertain behavior	377	62.4	109
101	55.	Organic disorders and dementia	376	71.7	99
102	76.	Other eye disorders	331	123.3	73
103	14.	Cancer of pancreas	316	31.3	140
104	63.	Eating disorders and obesity	313	36.7	131
105	30.	Cancer of brain and nervous system	312	31.0	141
106	62.	Anxiety and personality disorders	312	89.2	92
107	50.	Other metabolic and immune disorders	308	66.1	107
108	124.	Peritonitis, intestinal abscess, and other disorders of peritoneum	306	33.3	136
109	108.	Other upper respiratory diseases	304	101.0	83
110	67.	Central nervous system infection	295	58.8	112

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 2—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—All payers

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
111		Unclassifiable diagnosis codes	$295	77.4	96
112	72.	Paralysis	291	28.4	145
113	138.	Other male genital disorders	291	96.6	85
114	109.	Intestinal infections	287	125.0	71
115	123.	Anal and rectal conditions	273	94.5	89
116	169.	Spinal cord injury, including fracture	269	13.2	172
117	33.	Non-Hodgkin's lymphoma	268	28.6	144
118	159.	Rheumatoid arthritis and related disease	255	42.1	124
119	99.	Other disease of veins and lymphatics	255	63.7	108
120	180.	Indications for plastic surgery	252	106.7	80
121	7.	Other infections, including parasitic	248	23.6	150
122	60.	Other psychoses	248	51.2	117
123	9.	Fever of unknown origin	238	67.6	105
124	71.	Other hereditary and degenerative central nervous system diseases	234	36.5	132
125	110.	Disorders of teeth and jaw	232	70.2	101
126	10.	Cancer of head and neck	228	29.3	143
127	23.	Cancer of ovary	224	26.4	147
128	155.	Auto-immune and connective tissue disease	207	31.7	139
129	28.	Cancer of kidney	205	24.3	149
130	176.	Superficial injury, contusion	204	97.7	84
131	115.	Other peptic ulcer	203	38.0	129
132	47.	Other endocrine disorders	195	49.9	119
133	66.	Other mental disorders (not psychoses)	194	41.4	125
134	98.	Hemorrhoids	193	81.6	95
135	21.	Cancer of uterus	187	35.1	135
136	13.	Hepatobiliary cancer	180	17.0	160
137	185.	Other aftercare	177	69.5	102
138	5.	HIV (human immunodeficiency virus) infection	177	14.5	168
139	97.	Varicose veins of lower extremity	171	43.8	122
140	34.	Lymphosarcoma and reticulosarcoma	168	15.1	164
141	37.	Cancer, other primary	163	21.9	154
142	77.	Otitis media and related conditions	162	94.3	90
143	52.	Coagulation and hemorrhagic disorders	162	30.8	142
144	74.	Headache, including migraine	152	73.2	98
145	4.	Mycoses and actinomycoses	152	15.1	165
146	156.	Acquired foot deformities	147	59.0	110
147	78.	Conditions associated with dizziness or vertigo	144	68.0	104
148	36.	Multiple myeloma	141	14.6	167
149	75.	Cataract	140	54.7	115
150	3.	Other bacterial infections	137	32.7	138
151	163.	Other acquired deformities	136	22.7	151
152	45.	Thyroid disorders	135	37.1	130
153	64.	Adjustment reaction	133	44.4	121
154	154.	Other skin disorders	131	41.1	126
155	54.	Other hematologic conditions	131	42.2	123
156	53.	Diseases of white blood cells (nonmalignant)	126	22.2	153
157	1.	Tuberculosis	118	13.3	171
158	22.	Cancer of cervix	112	19.3	158

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 2—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—All payers

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
159	139.	Nonmalignant breast conditions	$103	41.0	127
160	131.	Nephritis, nephrosis	98	21.7	155
161	48.	Nutritional deficiencies	95	14.6	166
162	70.	Multiple sclerosis	91	16.4	162
163	15.	Cancer of other gastrointestinal organs, peritoneum	85	7.5	181
164	111.	Diseases of mouth, excluding dental	81	25.4	148
165	56.	Presenile dementia, including Alzheimer's	77	13.7	170
166	44.	Other carcinoma in situ	76	16.0	163
167	19.	Other cancer of skin (not melanoma)	74	18.4	159
168	32.	Hodgkin's disease	72	10.5	178
169	43.	Carcinoma in situ, cervix	71	20.2	157
170	69.	Parkinson's disease	71	12.8	173
171	79.	Other ear and sense organ disorders	66	22.4	152
172	68.	Other inflammatory diseases of the central nervous system	62	3.3	184
173	152.	Other inflammatory conditions of skin	58	13.9	169
174	184.	Medical examination, evaluation	52	32.8	137
175	144.	Menopausal disorders	46	16.7	161
176	181.	Allergic reactions	46	20.9	156
177	31.	Cancer of thyroid	40	10.7	176
178	8.	Sexually transmitted infections (not HIV or hepatitis)	39	11.8	174
179	145.	Infertility	37	11.5	175
180	26.	Cancer of other male genital organs	36	8.1	180
181	24.	Cancer of other female genital organs	35	5.5	182
182	18.	Melanoma	35	10.5	177
183	29.	Cancer of other urinary organs	27	3.2	185
184	17.	Cancer, other respiratory and intrathoracic	24	3.6	183
185	183.	Administrative/social admission	23	8.1	179
186	65.	Developmental disorders	17	2.2	186

[1] Diagnoses classified according to Clinical Classifications for Health Policy Research summary diagnosis categories (Elixhauser, Andrews, and Fox, 1993).

Note: Data are for discharges from short-term, general, non-Federal hospitals with 30 beds or more. Data are weighted to provide estimates for the 50 States and the District of Columbia.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Data from the Hospital Cost and Utilization Project.

Table 3
National billed charges and number of discharges for selected grouped diagnosis categories for hospitalizations, 1987—All payers

Grouped diagnosis category[1]	Billed charges in millions	Discharges in thousands
Cancers		
Digestive tract	$2,764	256.1
Respiratory tract	1,548	191.6
Reproductive organs:		
Female	1,279	269.1
Male	593	120.4
Hematologic	1,226	104.8
Urinary tract	612	103.0
Mental/behavioral disorders		
Dementias	453	85.5
Psychoses	1,051	217.0
Dependency disorders	2,618	565.3
Neuroses	2,751	588.5
Circulatory disorders		
All heart disease	21,516	3,501.4
Arterial disease	8,644	1,174.5
Venous disease	1,258	340.3
Gastric and duodenal ulcers	1,624	262.7
Renal failure	1,010	101.5
Spinal cord injury and other rehabilitation	1,629	108.2

[1] The summary diagnosis categories included in each grouped diagnosis category are as follows: digestive tract cancer: 11-15; respiratory tract cancer: 16, 17; cancer of reproductive organs, female: 20-24, 43; male: 25, 26; hematologic cancer: 32-36; urinary tract cancer: 27-29; dementias: 55, 56; psychoses: 59, 60; dependency disorders: 57, 58; neuroses: 61, 62, 64; all heart disease: 83, 84, 86-89; arterial disease: 90-94; venous disease: 96-99; gastric and duodenal ulcers: 113-115; renal failure: 132, 133; spinal cord injury and other rehabilitation: 169, 182.

Note: Data are for discharges from short-term, general, non-Federal hospitals with 30 beds or more.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Data from the Hospital Cost and Utilization Project.

Table 4
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Medicare expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
		Total	**$63,928**	**10,295.9**	**—**
1	84.	Ischemic heart disease	4,583	771.1	1
2	90.	Cerebrovascular disease	3,534	596.1	2
3	89.	Congestive heart failure	3,242	561.8	3
4	100.	Pneumonia and influenza	3,228	463.5	4
5	83.	Acute myocardial infarction	2,675	327.2	5
6	168.	Fracture of neck of femur (hip)	2,075	220.2	8
7	88.	Conduction disorders, dysrhythmias	1,849	326.2	6
8	175.	Complication of device or procedure	1,697	225.6	7
9	160.	Osteoarthritis	1,370	132.2	18
10	125.	Biliary tract disease	1,296	191.9	12
11	12.	Cancer of colon-rectum	1,161	107.3	24
12	134.	Urinary tract infection	1,051	199.3	11
13	2.	Septicemia	1,014	108.2	23
14	170.	Other fractures, not hip	970	191.2	13
15	46.	Diabetes mellitus	960	163.6	14
16	38.	Secondary malignancies	959	131.4	19
17	92.	Aneurysm and disorders of arteries	906	59.8	47
18	49.	Fluid and electrolyte disorders	881	200.4	10
19	121.	Intestinal obstruction without hernia	875	122.0	21
20	101.	Other respiratory infections (not tuberculosis)	871	161.5	15
21	16.	Cancer of bronchus, lung, trachea, larynx	838	102.4	25
22	102.	Chronic obstructive pulmonary disease and allied conditions	829	128.1	20
23	137.	Hyperplasia of prostate	813	202.9	9
24	91.	Atherosclerosis (not heart or brain)	735	75.3	38
25	161.	Spondylosis, intervertebral disc disorders, cervical disorders, other back pain	653	139.0	17
26	122.	Diverticulosis and diverticulitis	651	100.5	26
27	107.	Other lower respiratory diseases	602	88.0	32
28	182.	Rehabilitation care and fitting of prostheses	599	53.9	49
29	61.	Depression and affective disorders	586	92.9	30
30	93.	Peripheral arterial embolism	566	56.6	48
31	128.	Gastrointestinal hemorrhage	553	108.3	22
32	151.	Skin and subcutaneous infections	521	96.2	28
33	104.	Aspiration pneumonitis, food/vomitus	497	45.3	60
34	153.	Chronic ulcer of skin	471	46.1	59
35	113.	Gastric ulcer	458	65.7	44
36	40.	Maintenance chemotherapy, radiotherapy	446	144.1	16
37	103.	Asthma	436	95.8	29
38	25.	Cancer of prostate	429	88.0	33
39	114.	Duodenal ulcer	404	53.4	51
40	162.	Osteoporosis and other disorders of bone and cartilage	398	65.8	43
41	87.	Heart valve disorders	386	25.8	84
42	82.	Hypertension	379	75.0	39
43	133.	Chronic renal failure	365	32.6	77
44	86.	Other and ill-defined heart disease	351	43.7	63
45	136.	Other genitourinary disorders	342	77.9	37
46	73.	Epilepsy, convulsions	342	73.7	40
47	129.	Other gastrointestinal disorders	340	43.4	64
48	120.	Noninfectious enteritis and colitis	337	81.9	35

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 4—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Medicare expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
49	116.	Gastritis, upper gastrointestinal obstruction, nausea	$334	84.9	34
50	11.	Cancer of stomach and esophagus	330	23.5	88
51	96.	Thrombophlebitis and thromboembolism	325	71.5	42
52	95.	Syncope	318	98.3	27
53	51.	Anemias	314	78.9	36
54	127.	Pancreas disorders (not diabetes)	314	41.5	66
55	85.	Diseases of pulmonary circulation	313	41.1	68
56	119.	Other abdominal hernia	313	61.0	46
57	42.	Other benign neoplasms	307	51.7	55
58	94.	Other circulatory disease	306	41.3	67
59	20.	Cancer of breast	302	72.8	41
60	132.	Acute and unspecified renal failure	300	32.7	75
61	80.	Other nervous system disorders	288	49.9	57
62	126.	Liver disease, not alcohol related	271	38.6	71
63	106.	Respiratory failure/insufficiency (adult)	271	23.1	90
64	55.	Organic disorders and dementia	268	50.3	56
65	27.	Cancer of bladder	267	52.8	52
66	57.	Alcohol-related disorders	255	52.0	53
67	118.	Inguinal hernia	254	89.4	31
68	135.	Calculus of urinary tract	252	63.8	45
69	105.	Pleurisy, pneumothorax, pulmonary collapse	248	51.8	54
70	59.	Schizophrenic disorders	233	44.7	62
71	157.	Infective arthritis and osteomyelitis	229	21.5	96
72	112.	Esophageal disorders	226	53.4	50
73	172.	Intracranial injury (not fracture)	209	27.6	81
74	81.	Acute and chronic rheumatic disease	199	12.9	116
75	14.	Cancer of pancreas	192	20.1	98
76	39.	Neoplasms of unspecified site or uncertain behavior	191	31.0	78
77	142.	Prolapse of female genital organs	169	44.9	61
78	35.	Leukemia	168	14.8	108
79	124.	Peritonitis, intestinal abscess, and other disorders of peritoneum	162	13.8	114
80	99.	Other disease of veins and lymphatics	160	37.9	72
81	179.	Other external injury	151	39.0	70
82	159.	Rheumatoid arthritis and related disease	143	22.4	93
83	76.	Other eye disorders	138	47.9	58
84	178.	Poisoning	138	32.7	76
85		Unclassifiable diagnosis codes	130	27.6	80
86	130.	Abdominal pain	130	40.4	69
87	72.	Paralysis	127	13.1	115
88	108.	Other upper respiratory diseases	124	33.5	74
89	33.	Non-Hodgkin's lymphoma	124	14.8	107
90	117.	Appendicitis	120	14.5	110
91	28.	Cancer of kidney	116	12.5	117
92	6.	Viral infections (not gastrointestinal or HIV)	115	24.6	87
93	71.	Other hereditary and degenerative central nervous system diseases	113	17.6	102
94	10.	Cancer of head and neck	113	14.2	112
95	13.	Hepatobiliary cancer	111	10.5	125
96	123.	Anal and rectal conditions	109	27.1	82
97	173.	Internal injury to viscera or vessels, crushing injury	109	10.3	126

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 4—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Medicare expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
98	60.	Other psychoses	$108	18.6	101
99	75.	Cataract	108	42.2	65
100	21.	Cancer of uterus	107	18.9	100
101	115.	Other peptic ulcer	106	16.6	104
102	9.	Fever of unknown origin	105	21.8	95
103	23.	Cancer of ovary	105	10.7	123
104	47.	Other endocrine disorders	104	24.9	85
105	138.	Other male genital disorders	104	26.5	83
106	30.	Cancer of brain and nervous system	100	9.6	129
107	36.	Multiple myeloma	100	9.9	128
108	50.	Other metabolic and immune disorders	97	20.1	99
109	146.	Other female genital disorders	96	20.8	97
110	164.	Other muscle, bone, connective tissue disease	96	22.2	94
111	158.	Other joint disorders (not trauma)	94	24.8	86
112	171.	Sprains and strains	90	29.8	79
113	34.	Lymphosarcoma and reticulosarcoma	86	7.9	135
114	177.	Burns	84	6.5	143
115	109.	Intestinal infections	84	22.6	91
116	97.	Varicose veins of lower extremity	80	14.5	111
117	78.	Conditions associated with dizziness or vertigo	76	33.6	73
118	52.	Coagulation and hemorrhagic disorders	69	11.2	120
119	176.	Superficial injury, contusion	69	23.3	89
120	185.	Other aftercare	66	22.6	92
121	174.	Open wounds	66	15.5	105
122	165.	Congenital anomalies	64	8.6	132
123	155.	Auto-immune connective tissue disease	63	10.3	127
124	37.	Cancer, other primary	62	8.3	133
125	48.	Nutritional deficiencies	62	9.6	130
126	56.	Presenile dementia, including Alzheimer's	61	11.8	119
127	53.	Diseases of white blood cells (nonmalignant)	61	9.2	131
128	62.	Anxiety and personality disorders	60	15.5	106
129	4.	Mycoses and actinomycoses	59	5.6	148
130	69.	Parkinson's disease	57	10.6	124
131	167.	Joint disorders, trauma related	55	14.7	109
132	45.	Thyroid disorders	54	10.8	122
133	67.	Central nervous system infection	53	4.9	155
134	58.	Drug disorders, not alcohol related	47	12.0	118
135	98.	Hemorrhoids	46	16.9	103
136	131.	Nephritis, nephrosis	43	6.7	142
137	19.	Other cancer of skin (not melanoma)	42	11.0	121
138	1.	Tuberculosis	42	4.9	154
139	3.	Other bacterial infections	41	5.2	153
140	15.	Cancer of other gastrointestinal organs, peritoneum	41	3.7	163
141	154.	Other skin disorders	40	8.1	134
142	54.	Other hematologic conditions	39	6.0	144
143	169.	Spinal cord injury, including fracture	39	2.1	172
144	44.	Other carcinoma in situ	37	7.0	140
145	156.	Acquired foot deformities	35	14.2	113
146	163.	Other acquired deformities	35	5.2	152
147	70.	Multiple sclerosis	29	4.4	160
148	111.	Diseases of mouth, excluding dental	28	7.1	139

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 4—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Medicare expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
149	143.	Menstrual disorders and ovarian cyst	$28	5.5	149
150	22.	Cancer of cervix	28	4.8	156
151	140.	Inflammation of female pelvic organs	23	4.4	159
152	152.	Other inflammatory conditions of skin	23	4.2	162
153	110.	Disorders of teeth and jaw	22	7.6	136
154	24.	Cancer of other female genital organs	21	3.3	166
155	68.	Other inflammatory diseases of the central nervous system	[2]21	0.8	182
156	41.	Benign neoplasm, uterus	21	4.8	157
157	79.	Other ear and sense organ disorders	20	4.3	161
158	74.	Headache, including migraine	20	7.5	137
159	29.	Cancer of other urinary organs	19	2.2	171
160	139.	Nonmalignant breast conditions	19	7.2	138
161	181.	Allergic reactions	18	5.8	146
162	7.	Other infections, including parasitic	18	2.3	170
163	180.	Indications for plastic surgery	16	7.0	141
164	77.	Otitis media and related conditions	16	5.4	150
165	32.	Hodgkin's disease	16	1.9	175
166	144.	Menopausal disorders	15	5.9	145
167	18.	Melanoma	14	3.7	164
168	66.	Other mental disorders (not psychoses)	13	4.5	158
169	63.	Eating disorders and obesity	13	2.5	169
170	17.	Cancer, other respiratory and intrathoracic	12	2.0	174
171	31.	Cancer of thyroid	12	2.1	173
172	5.	HIV (human immunodeficiency virus) infection	10	0.7	183
173	184.	Medical examination, evaluation	10	5.6	147
174	149.	Complications of birth, puerperium	10	3.6	165
175	64.	Adjustment reaction	9	2.8	168
176	148.	Complications during pregnancy	7	2.9	167
177	150.	Normal delivery/liveborn	7	5.2	151
178	8.	Sexually transmitted infections (not HIV or hepatitis)	[2]6	1.2	177
179	141.	Endometriosis	6	1.1	178
180	43.	Carcinoma in situ, cervix	5	1.3	176
181	26.	Cancer of other male genital organs	[2]4	0.9	181
182	183.	Administrative/social admission	3	1.0	179
183	147.	Pregnancy with abortive outcome	3	1.0	180
184	65.	Developmental disorders	[2]2	0.4	184
185	166.	Perinatal conditions	1	0.3	185
186	145.	Infertility	[2]0	0.0	186

[1] Diagnoses classified according to Clinical Classifications for Health Policy Research summary diagnosis categories (Elixhauser, Andrews, and Fox, 1993).
[2] Use this estimate cautiously. This estimate is based on fewer than 100 discharges in the HCUP-2 database, of which fewer than 60 are likely to have charges.

Note: Data are for discharges from short-term, general, non-Federal hospitals with 30 beds or more. Data are weighted to provide estimates for the 50 States and the District of Columbia.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Data from the Hospital Cost and Utilization Project.

Table 5
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Medicaid expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
		Total	**$13,650**	**3,691.7**	—
1	150.	Normal delivery/liveborn	$1,538	897.4	1
2	149.	Complications of birth, puerperium	1,058	450.6	2
3	148.	Complications during pregnancy	449	232.6	3
4	100.	Pneumonia and influenza	409	92.7	4
5	84.	Ischemic heart disease	351	69.0	8
6	61.	Depression and affective disorders	350	71.2	7
7	170.	Other fractures, not hip	344	51.4	10
8	166.	Perinatal conditions	335	28.2	22
9	90.	Cerebrovascular disease	258	25.5	28
10	101.	Other respiratory infections (not tuberculosis)	222	91.9	5
11	59.	Schizophrenic disorders	220	43.2	14
12	46.	Diabetes mellitus	218	43.7	12
13	175.	Complication of device or procedure	217	32.9	20
14	103.	Asthma	216	80.7	6
15	125.	Biliary tract disease	208	41.5	16
16	57.	Alcohol-related disorders	203	57.3	9
17	182.	Rehabilitation care and fitting of prostheses	201	6.7	83
18	89.	Congestive heart failure	197	26.2	25
19	165.	Congenital anomalies	184	25.3	29
20	172.	Intracranial injury (not fracture)	177	19.7	37
21	83.	Acute myocardial infarction	156	15.6	44
22	134.	Urinary infection	138	35.6	18
23	151.	Skin and subcutaneous infections	129	33.3	19
24	178.	Poisoning	125	43.5	13
25	73.	Epilepsy, convulsions	123	40.3	17
26	147.	Pregnancy with abortive outcome	106	49.1	11
27	127.	Pancreas disorders (not diabetes)	103	17.2	41
28	140.	Inflammation of female pelvic organs	102	32.1	21
29	2.	Septicemia	100	12.2	49
30	173.	Internal injury to viscera or vessels, crushing injury	99	8.5	70
31	120.	Noninfectious enteritis and colitis	99	42.0	15
32	51.	Anemias	96	25.6	26
33	107.	Other lower respiratory diseases	92	15.9	43
34	102.	Chronic obstructive pulmonary disease and allied conditions	92	17.4	40
35	40.	Maintenance chemotherapy, radiotherapy	92	25.5	27
36	38.	Secondary malignancies	90	11.5	51
37	161.	Spondylosis, intervertebral disc disorders, cervical disorders, other back pain	88	23.9	30
38	133.	Chronic renal failure	85	8.2	72
39	174.	Open wounds	85	22.3	32
40	177.	Burns	83	8.0	74
41	58.	Drug disorders, not alcohol related	83	27.0	23
42	117.	Appendicitis	83	18.5	38
43	88.	Conduction disorders, dysrhythmias	82	15.2	45
44	49.	Fluid and electrolyte disorders	82	26.5	24
45	86.	Other and ill-defined heart disease	79	7.5	78
46	126.	Liver disease, not alcohol related	78	9.4	61

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 5—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Medicaid expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
47	121.	Intestinal obstruction without hernia	$77	12.3	48
48	80.	Other nervous system disorders	77	10.2	58
49	168.	Fracture of neck of femur (hip)	75	5.9	89
50	153.	Chronic ulcer of skin	74	6.2	86
51	16.	Cancer of bronchus, lung, trachea, larynx	74	9.1	65
52	35.	Leukemia	67	3.6	114
53	143.	Menstrual disorders and ovarian cyst	65	22.7	31
54	66.	Other mental disorders (not psychoses)	62	9.4	63
55	62.	Anxiety and personality disorders	61	15.1	46
56	128.	Gastrointestinal hemorrhage	60	10.4	56
57	146.	Other female genital disorders	59	20.7	34
58	157.	Infective arthritis and osteomyelitis	58	5.8	91
59	6.	Viral infections (not gastrointestinal or HIV)	58	20.5	35
60	179.	Other external injury	57	13.9	47
61	116.	Gastritis, upper gastrointestinal obstruction, nausea	56	21.2	33
62	50.	Other metabolic and immune disorders	52	10.9	52
63	105.	Pleurisy, pneumothorax, pulmonary collapse	51	10.7	53
64	104.	Aspiration pneumonitis, food/vomitus	50	4.0	106
65	129.	Other gastrointestinal disorders	50	7.6	77
66	42.	Other benign neoplasms	50	8.8	67
67	5.	HIV (human immunodeficiency virus) infection	49	4.5	101
68	67.	Central nervous system infection	49	9.0	66
69	169.	Spinal cord injury, including fracture	49	1.7	154
70	7.	Other infections, including parasitic	49	4.2	105
71	12.	Cancer of colon-rectum	48	3.3	119
72	119.	Other abdominal hernia	48	10.4	55
73	96.	Thrombophlebitis and thromboembolism	47	9.4	60
74	109.	Intestinal infections	45	17.0	42
75	71.	Other hereditary and degenerative central nervous system diseases	44	3.3	121
76	72.	Paralysis	44	3.2	125
77	135.	Calculus of urinary tract	43	12.0	50
78	91.	Atherosclerosis (not heart or brain)	43	3.9	108
79	136.	Other genitourinary disorders	43	8.8	69
80	162.	Osteoporosis and other disorders of bone and cartilage	43	8.0	73
81	130.	Abdominal pain	42	20.3	36
82	112.	Esophageal disorders	41	8.8	68
83	60.	Other psychoses	41	7.3	79
84	55.	Organic disorders and dementia	40	4.3	102
85	82.	Hypertension	39	10.4	54
86	113.	Gastric ulcer	39	5.0	98
87	41.	Benign neoplasm, uterus	39	9.3	64
88	93.	Peripheral arterial embolism	38	3.3	120
89	64.	Adjustment reaction	36	9.4	62
90	132.	Acute and unspecified renal failure	35	3.0	127
91	11.	Cancer of stomach and esophagus	35	2.5	137
92	164.	Other muscle, bone, connective tissue disease	34	6.5	85
93	114.	Duodenal ulcer	34	4.7	100
94		Unclassifiable diagnosis codes	33	7.8	76
95	85.	Diseases of pulmonary circulation	32	3.8	110

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 5—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Medicaid expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
96	106.	Respiratory failure/insufficiency (adult)	$32	2.9	129
97	94.	Other circulatory disease	31	3.9	107
98	30.	Cancer of brain and nervous system	30	2.4	141
99	76.	Other eye disorders	30	10.0	59
100	160.	Osteoarthritis	30	3.5	118
101	108.	Other upper respiratory diseases	29	8.0	75
102	13.	Hepatobiliary cancer	28	0.9	170
103	92.	Aneurysm and disorders of arteries	27	2.2	144
104	20.	Cancer of breast	27	5.3	96
105	77.	Otitis media and related conditions	27	17.8	39
106	167.	Joint disorders, trauma related	27	6.8	81
107	1.	Tuberculosis	26	2.4	139
108	87.	Heart valve disorders	26	2.0	148
109	37.	Cancer, other primary	24	1.6	158
110	81.	Acute and chronic rheumatic disease	24	1.9	151
111	9.	Fever of unknown origin	24	8.5	71
112	4.	Mycoses and actinomycoses	23	2.0	150
113	155.	Auto-immune connective tissue disease	23	3.6	112
114	124.	Peritonitis, intestinal abscess, and other disorders of peritoneum	23	2.5	134
115	39.	Neoplasms of unspecified site or uncertain behavior	23	3.5	116
116	52.	Coagulation and hemorrhagic disorders	22	3.5	117
117	141.	Endometriosis	22	5.8	90
118	142.	Prolapse of female genital organs	22	6.1	87
119	3.	Other bacterial infections	22	5.1	97
120	22.	Cancer of cervix	22	3.6	113
121	118.	Inguinal hernia	22	10.4	57
122	63.	Eating disorders and obesity	22	2.9	130
123	122.	Diverticulosis and diverticulitis	21	3.2	124
124	10.	Cancer of head and neck	20	2.6	133
125	33.	Non-Hodgkin's lymphoma	20	1.3	162
126	47.	Other endocrine disorders	19	4.3	103
127	158.	Other joint disorders (not trauma)	19	6.1	88
128	14.	Cancer of pancreas	19	1.3	163
129	110.	Disorders of teeth and jaw	19	5.7	92
130	95.	Syncope	18	6.5	84
131	171.	Sprains and strains	16	6.7	82
132	159.	Rheumatoid arthritis and related disease	16	2.2	143
133	123.	Anal and rectal conditions	15	5.6	94
134	34.	Lymphosarcoma and reticulosarcoma	15	0.7	173
135	138.	Other male genital disorders	14	5.6	93
136	99.	Other disease of veins and lymphatics	14	3.3	123
137	176.	Superficial injury, contusion	14	7.2	80
138	163.	Other acquired deformities	13	1.9	152
139	131.	Nephritis, nephrosis	13	2.2	145
140	137.	Hyperplasia of prostate	13	3.0	128
141	154.	Other skin disorders	12	3.9	109
142	97.	Varicose veins of lower extremity	12	2.4	138
143	74.	Headache, including migraine	12	5.6	95
144	8.	Sexually transmitted infections (not HIV or hepatitis)	12	3.3	122

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 5—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Medicaid expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
145	115.	Other peptic ulcer	$12	2.5	135
146	68.	Other inflammatory diseases of central nervous system	[2]11	0.4	180
147	180.	Indications for plastic surgery	11	4.2	104
148	53.	Diseases of white blood cells (nonmalignant)	11	1.8	153
149	54.	Other hematologic conditions	11	4.8	99
150	45.	Thyroid disorders	10	2.4	140
151	23.	Cancer of ovary	10	1.4	161
152	43.	Carcinoma in situ, cervix	10	3.1	126
153	70.	Multiple sclerosis	10	1.5	159
154	98.	Hemorrhoids	9	3.8	111
155	185.	Other aftercare	8	3.5	115
156	48.	Nutritional deficiencies	8	1.4	160
157	21.	Cancer of uterus	8	1.1	165
158	15.	Cancer of other gastrointestinal organs, peritoneum	[2]8	0.5	177
159	27.	Cancer of bladder	8	1.2	164
160	111.	Diseases of mouth, excluding dental	8	2.2	142
161	28.	Cancer of kidney	7	1.0	167
162	32.	Hodgkin's disease	7	1.0	166
163	56.	Presenile dementia, including Alzheimer's	[2]7	0.3	183
164	79.	Other ear and sense organ disorders	6	2.1	147
165	156.	Acquired foot deformities	6	2.5	136
166	139.	Nonmalignant breast conditions	6	2.7	132
167	181.	Allergic reactions	6	2.1	146
168	152.	Other inflammatory conditions of skin	6	1.6	156
169	65.	Developmental disorders	5	0.9	168
170	78.	Conditions associated with dizziness or vertigo	5	2.0	149
171	25.	Cancer of prostate	5	0.9	169
172	36.	Multiple myeloma	[2]4	0.4	181
173	75.	Cataract	4	1.6	155
174	184.	Medical examination, evaluation	4	2.8	131
175	69.	Parkinson's disease	[2]3	0.3	182
176	24.	Cancer of other female genital organs	[2]3	0.4	178
177	19.	Other cancer of skin (not melanoma)	3	0.6	175
178	183.	Administrative/social admission	3	1.6	157
179	44.	Other carcinoma in situ	[2]3	0.7	174
180	145.	Infertility	3	0.8	172
181	144.	Menopausal disorders	2	0.8	171
182	26.	Cancer of other male genital organs	[2]2	0.4	179
183	31.	Cancer of thyroid	[2]2	0.5	176
184	17.	Cancer, other respiratory and intrathoracic	[2]2	0.2	184
185	18.	Melanoma	[2]1	0.2	185
186	29.	Cancer of other urinary organs	[2]1	0.1	186

[1] Diagnoses classified according to Clinical Classifications for Health Policy Research summary diagnosis categories (Elixhauser, Andrews, and Fox, 1993).

[2] Use this estimate cautiously. This estimate is based on fewer than 100 discharges in the HCUP-2 database, of which fewer than 60 are likely to have charges.

Note: Data are for discharges from short-term, general, non-Federal hospitals with 30 beds or more. Data are weighted to provide estimates for the 50 States and the District of Columbia.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Data from the Hospital Cost and Utilization Project.

Table 6
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Private insurance expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
		Total	**$50,310**	**14,575.4**	—
1	84.	Ischemic heart disease	$3,365	635.4	3
2	150.	Normal delivery/liveborn	2,880	2,463.2	1
3	149.	Complications of birth, puerperium	2,655	1,307.9	2
4	170.	Other fractures, not hip	1,608	328.6	7
5	83.	Acute myocardial infarction	1,397	167.4	17
6	125.	Biliary tract disease	1,245	288.2	8
7	161.	Spondylosis, intervertebral disc disorders, cervical disorders, other back pain	1,157	331.6	6
8	61.	Depression and affective disorders	1,095	209.6	11
9	90.	Cerebrovascular disease	980	143.7	21
10	100.	Pneumonia and influenza	976	247.2	9
11	57.	Alcohol-related disorders	969	191.4	12
12	175.	Complication of device or procedure	896	183.9	14
13	148.	Complications during pregnancy	872	480.4	4
14	101.	Other respiratory infections (not tuberculosis)	693	353.9	5
15	38.	Secondary malignancies	633	87.5	39
16	40.	Maintenance chemotherapy, radiotherapy	583	185.9	13
17	58.	Drug disorders, not alcohol related	569	78.4	45
18	41.	Benign neoplasm, uterus	543	143.9	20
19	117.	Appendicitis	539	153.9	19
20	135.	Calculus of urinary tract	534	226.8	10
21	143.	Menstrual disorders and ovarian cyst	508	167.4	18
22	88.	Conduction disorders, dysrhythmias	501	123.9	25
23	16.	Cancer of bronchus, lung, trachea, larynx	501	61.0	55
24	172.	Intracranial injury (not fracture)	495	106.8	29
25	120.	Noninfectious enteritis and colitis	488	181.8	15
26	160.	Osteoarthritis	482	56.5	59
27	46.	Diabetes mellitus	478	125.6	23
28	103.	Asthma	477	173.7	16
29	165.	Congenital anomalies	477	88.2	38
30	166.	Perinatal conditions	462	57.8	58
31	89.	Congestive heart failure	438	75.9	47
32	173.	Internal injury to viscera or vessels, crushing injury	426	45.3	78
33	182.	Rehabilitation care and fitting of prostheses	414	25.0	101
34	42.	Other benign neoplasms	408	101.4	33
35	146.	Other female genital disorders	405	125.2	24
36	151.	Skin and subcutaneous infections	376	115.5	27
37	121.	Intestinal obstruction without hernia	367	63.1	54
38	12.	Cancer of colon-rectum	363	41.4	80
39	140.	Inflammation of female pelvic organs	343	102.5	31
40	141.	Endometriosis	331	93.6	35
41	127.	Pancreas disorders (not diabetes)	326	50.2	69
42	134.	Urinary infection	321	102.3	32
43	35.	Leukemia	308	14.9	126
44	142.	Prolapse of female genital organs	286	79.2	44
45	167.	Joint disorders, trauma related	283	91.2	37
46	80.	Other nervous system disorders	277	59.8	56
47	171.	Sprains and strains	275	106.4	30
48	20.	Cancer of breast	271	72.3	48

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 6—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Private insurance expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
49	147.	Pregnancy with abortive outcome	$270	141.0	22
50	174.	Open wounds	267	84.2	41
51	107.	Other lower respiratory diseases	263	48.5	73
52	122.	Diverticulosis and diverticulitis	261	51.8	64
53	63.	Eating disorders and obesity	260	27.8	95
54	86.	Other and ill-defined heart disease	259	38.1	85
55	116.	Gastritis, upper gastrointestinal obstruction, nausea	251	96.1	34
56	118.	Inguinal hernia	240	122.9	26
57	92.	Aneurysm and disorders of arteries	240	22.5	108
58	102.	Chronic obstructive pulmonary disease and allied conditions	235	46.2	76
59	137.	Hyperplasia of prostate	234	68.8	50
60	119.	Other abdominal hernia	229	64.3	52
61	178.	Poisoning	226	93.6	36
62	2.	Septicemia	220	30.8	93
63	136.	Other genitourinary disorders	220	57.8	57
64	162.	Osteoporosis and other disorders of bone and cartilage	220	43.4	79
65	168.	Fracture of neck of femur (hip)	212	24.0	105
66	105.	Pleurisy, pneumothorax, pulmonary collapse	208	63.1	53
67	73.	Epilepsy, convulsions	208	79.4	43
68	93.	Peripheral arterial embolism	208	24.3	104
69	96.	Thrombophlebitis and thromboembolism	207	55.3	61
70	130.	Abdominal pain	205	108.7	28
71	59.	Schizophrenic disorders	204	33.2	91
72	129.	Other gastrointestinal disorders	199	35.9	88
73	6.	Viral infections (not gastrointestinal or HIV)	198	82.5	42
74	180.	Indications for plastic surgery	196	84.2	40
75	164.	Other muscle, bone, connective tissue disease	196	51.2	65
76	49.	Fluid and electrolyte disorders	192	77.8	46
77	91.	Atherosclerosis (not heart or brain)	188	25.1	100
78	114.	Duodenal ulcer	185	39.0	83
79	158.	Other joint disorders (not trauma)	182	70.3	49
80	126.	Liver disease, not alcohol related	182	32.3	92
81	87.	Heart valve disorders	181	18.7	117
82	157.	Infective arthritis and osteomyelitis	172	21.7	109
83	110.	Disorders of teeth and jaw	166	48.6	72
84	113.	Gastric ulcer	165	33.7	89
85	112.	Esophageal disorders	161	49.2	71
86	82.	Hypertension	158	45.4	77
87	177.	Burns	155	19.2	115
88	128.	Gastrointestinal hemorrhage	152	37.8	86
89	30.	Cancer of brain and nervous system	151	16.3	122
90	51.	Anemias	151	37.5	87
91	85.	Diseases of pulmonary circulation	149	20.4	111
92	179.	Other external injury	147	52.1	63
93	62.	Anxiety and personality disorders	146	40.2	82
94	67.	Central nervous system infection	140	33.6	90
95	138.	Other male genital disorders	135	50.7	67
96	39.	Neoplasms of unspecified site or uncertain behavior	133	22.9	107
97	11.	Cancer of stomach and esophagus	129	10.3	142
98	7.	Other infections, including parasitic	128	12.7	134
99	76.	Other eye disorders	124	49.7	70

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 6—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Private insurance expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
100	81.	Acute and chronic rheumatic disease	$124	10.5	139
101	98.	Hemorrhoids	123	54.1	62
102	109.	Intestinal infections	121	68.2	51
103	169.	Spinal cord injury, including fracture	120	5.7	168
104	108.	Other upper respiratory diseases	117	48.0	74
105	50.	Other metabolic and immune disorders	117	25.2	99
106	123.	Anal and rectal conditions	115	50.8	66
107	33.	Non-Hodgkin's lymphoma	112	10.5	141
108	95.	Syncope	103	46.6	75
109	25.	Cancer of prostate	103	19.1	116
110	155.	Auto-immune connective tissue disease	102	14.3	128
111	66.	Other mental disorders (not psychoses)	102	21.0	110
112	74.	Headache, including migraine	101	50.5	68
113	124.	Peritonitis, intestinal abscess, and other disorders of peritoneum	99	13.7	129
114	133.	Chronic renal failure	99	10.5	140
115	77.	Otitis media and related conditions	94	55.4	60
116	156.	Acquired foot deformities	94	38.5	84
117	23.	Cancer of ovary	94	12.3	136
118	106.	Respiratory failure/insufficiency (adult)	92	7.1	161
119	27.	Cancer of bladder	90	17.9	119
120	9.	Fever of unknown origin	88	29.6	94
121	94.	Other circulatory disease	87	18.3	118
122	159.	Rheumatoid arthritis and related disease	86	15.5	124
123	14.	Cancer of pancreas	82	7.9	158
124	72.	Paralysis	81	8.2	155
125	176.	Superficial injury, contusion	80	40.6	81
126	153.	Chronic ulcer of skin	78	9.3	149
127	132.	Acute and unspecified renal failure	78	7.2	160
128		Unclassifiable diagnosis codes	76	25.0	102
129	10.	Cancer of head and neck	73	10.0	147
130	60.	Other psychoses	71	15.2	125
131	28.	Cancer of kidney	71	9.2	151
132	37.	Cancer, other primary	70	10.0	146
133	97.	Varicose veins of lower extremity	66	23.5	106
134	139.	Nonmalignant breast conditions	66	25.9	98
135	5.	HIV (human immunodeficiency virus) infection	64	5.9	165
136	99.	Other disease of veins and lymphatics	64	17.8	120
137	163.	Other acquired deformities	64	10.9	138
138	64.	Adjustment reaction	61	20.4	113
139	21.	Cancer of uterus	61	12.9	132
140	71.	Other hereditary and degenerative central nervous system diseases	60	10.9	137
141	54.	Other hematologic conditions	59	25.0	103
142	45.	Thyroid disorders	59	20.2	114
143	115.	Other peptic ulcer	57	14.5	127
144	4.	Mycoses and actinomycoses	57	5.8	166
145	52.	Coagulation and hemorrhagic disorders	57	12.3	135
146	13.	Hepatobiliary cancer	53	4.7	172
147	154.	Other skin disorders	53	20.4	112
148	78.	Conditions associated with dizziness or vertigo	52	27.0	97

See notes at end of table. Data from AHCPR, Division of Provider Studies, Hospital Cost and Utilization Project.

Table 6—Continued
National billed charges and number of discharges for diagnoses ranked by charges for hospitalizations, 1987—Private insurance expected primary payer

Rank by charges		Summary diagnosis category[1]	Billed charges in millions	Discharges in thousands	Rank by discharges
149	185.	Other aftercare	$52	27.5	96
150	34.	Lymphosarcoma and reticulosarcoma	52	5.5	169
151	47.	Other endocrine disorders	52	15.7	123
152	3.	Other bacterial infections	51	16.7	121
153	70.	Multiple sclerosis	49	9.5	148
154	53.	Diseases of white blood cells (nonmalignant)	47	9.3	150
155	22.	Cancer of cervix	47	8.1	156
156	43.	Carcinoma in situ, cervix	46	13.0	131
157	32.	Hodgkin's disease	41	6.3	164
158	55.	Organic disorders and dementia	41	10.2	144
159	104.	Aspiration pneumonitis, food/vomitus	40	4.4	173
160	111.	Diseases of mouth, excluding dental	36	12.8	133
161	131.	Nephritis, nephrosis	34	10.2	145
162	15.	Cancer of other gastrointestinal organs, peritoneum	33	2.9	177
163	79.	Other ear and sense organ disorders	32	13.5	130
164	44.	Other carcinoma in situ	31	7.3	159
165	145.	Infertility	29	8.7	154
166	36.	Multiple myeloma	27	3.5	174
167	144.	Menopausal disorders	24	8.0	157
168	75.	Cataract	23	8.7	153
169	31.	Cancer of thyroid	23	7.0	162
170	19.	Other cancer of skin (not melanoma)	23	5.5	171
171	152.	Other inflammatory conditions of skin	21	6.5	163
172	68.	Other inflammatory diseases of the central nervous system	21	1.7	180
173	1.	Tuberculosis	19	2.8	178
174	26.	Cancer of other male genital organs	19	5.5	170
175	18.	Melanoma	18	5.7	167
176	48.	Nutritional deficiencies	18	2.4	179
177	181.	Allergic reactions	17	10.3	143
178	184.	Medical examination, evaluation	16	8.8	152
179	8.	Sexually transmitted infections (not HIV or hepatitis)	11	3.4	175
180	24.	Cancer of other female genital organs	9	1.4	181
181	17.	Cancer, other respiratory and intrathoracic	9	1.2	182
182	65.	Developmental disorders	[2]6	0.4	186
183	29.	Cancer of other urinary organs	[2]5	0.7	185
184	56.	Presenile dementia, including Alzheimer's	5	1.0	183
185	69.	Parkinson's disease	4	1.0	184
186	183.	Administrative/social admission	4	2.9	176

[1] Diagnoses classified according to Clinical Classifications for Health Policy Research summary diagnosis categories (Elixhauser, Andrews, and Fox, 1993).

[2] Use this estimate cautiously. This estimate is based on fewer than 100 discharges in the HCUP-2 database, of which fewer than 60 are likely to have charges.

Note: Data are for discharges from short-term, general, non-Federal hospitals with 30 beds or more. Data are weighted to provide estimates for the 50 States and the District of Columbia.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Data from the Hospital Cost and Utilization Project.

Table 7
AHCPR Patient Outcomes Research Team (PORT)[1] conditions and ranking of hospital charges by expected primary payer group

AHCPR-sponsored PORT condition	Among 25 most costly conditions		
	Medicare	Medicaid	Private insurance
Acute myocardial infarction	X	X	X
Back pain	X		X
Benign prostatic hypertrophy	X		
Biliary tract disease	X	X	X
Cataract			
Childbirth		X	X
Diabetes	X	X	
Hip fracture repair and osteoarthritis	X		
Ischemic heart disease	X	X	X
Low birthweight		X	X
Pneumonia	X	X	X
Schizophrenia		X	
Stroke	X	X	X
Total knee replacement	X		

[1] PORTs are projects funded by AHCPR since 1990 for the study of effective treatments of specific medical problems.

Note: "X" means the condition ranked among the top 25 conditions in terms of hospital charges; blank means the condition was not among the top 25. AHCPR is Agency for Health Care Policy and Research.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies: Data from the Hospital Cost and Utilization Project, 1987.

Appendix A
Summary diagnosis categories and ICD-9-CM codes

Category number	Diagnosis category	ICD-9-CM codes[1]
	Infectious and Parasitic Diseases	
1.	Tuberculosis	010-018, 137, 795.5, V01.1, V03.2, V71.2, V74.1
2.	Septicemia	038
3.	Other bacterial infections	020-037, 040-041, 790.7, V02.4-V02.5, V03.3-V03.9, V74.2-V74.4, V74.6, V74.8-V74.9
4.	Mycoses and actinomycoses	039, 110-118, V75.4
5.	HIV (human immunodeficiency virus) infection	042-044, 279.10, 279.19, 795.8
6.	Viral infections	050-079, 138, 139.1-139.8, 790.8, V01.2-V01.5, V01.7, V02.6, V04, V05.1, V73
7.	Other infections, including parasitic	080-088, 100-104, 120-134, 136, 795.3, V01.8-V01.9, V05.2, V06.1-V06.9, V07.0, V07.3-V07.9, V12.0, V75.0-V75.3, V75.5-V75.9
8.	Sexually transmitted infections (not HIV or hepatitis)	090-099, 795.6, V01.6, V02.7-V02.8, V74.5
9.	Fever of unknown origin	780.6
	Neoplasms and Carcinoma in Situ	
10.	Cancer of head and neck	140-149, 195.0
11.	Cancer of stomach and esophagus	150-151, V10.04
12.	Cancer of colon-rectum	153-154, V10.05, V10.06, V76.41
13.	Hepatobiliary cancer	155-156, V10.07
14.	Cancer of pancreas	157
15.	Cancer of other gastrointestinal organs, peritoneum	152, 158-159, V10.00-V10.03, V10.09, V76.42
16.	Cancer of bronchus, lung, trachea, larynx	161, 162
17.	Cancer, other respiratory and intrathoracic	160, 163, 165, V10.1, V10.2, V76.0
18.	Melanoma	172, V10.82
19.	Other cancer of skin (not melanoma)	173, V10.83, V76.43
20.	Cancer of breast	174-175, 793.8, V10.3, V52.4, V76.1
21.	Cancer of uterus	179, 182, V10.42
22.	Cancer of cervix	180, 795.0, V76.2, V10.41
23.	Cancer of ovary	183.0, V10.43
24.	Cancer of other female genital organs	181, 183.2-183.9, 184, V10.40, V10.44
25.	Cancer of prostate	185, V10.46
26.	Cancer of other male genital organs	186-187, V10.45, V10.47-V10.49
27.	Cancer of bladder	188, V10.51, V76.3
28.	Cancer of kidney	189.0-189.1, V10.52
29.	Cancer of other urinary organs	189.2-189.9, V10.50, V10.59
30.	Cancer of brain and nervous system	191-192, V10.85
31.	Cancer of thyroid	193, V10.87
32.	Hodgkin's disease	201, V10.72
33.	Non-Hodgkin's lymphoma	202, V10.79
34.	Lymphosarcoma and reticulosarcoma	200, V10.71
35.	Leukemia	203.1, 204-208, V10.6
36.	Multiple myeloma	203.0
37.	Cancer, other primary	164, 170-171, 190, 194, 195.1-195.9, 203.8, 795.1, V10.81, V10.84, V10.86, V10.88-V10.99, V76.49, V76.8-V76.9
38.	Secondary malignancies	196-198
39.	Neoplasms of unspecified site or uncertain behavior	199, 235-239

See note at end of table. Source: AHCPR, Division of Provider Studies.

Appendix A—Continued
Summary diagnosis categories and ICD-9-CM codes

Category number	Diagnosis category	ICD-9-CM codes[1]
40.	Maintenance chemotherapy, radiotherapy	V58.0-V58.1, V66.1-V66.2, V67.1-V67.2
41.	Benign neoplasm, uterus	218-219
42.	Other benign neoplasms	210-217, 220-229, V71.1
43.	Carcinoma in situ, cervix	233.1
44.	Other carcinoma in situ	230-233.0, 233.2-234
	Endocrine, Nutritional, and Metabolic Diseases and Immunity Disorders	
45.	Thyroid disorders	240-246, 794.5, V77.0
46.	Diabetes mellitus	250, 251.0, 790.2, 791.5-791.6, V77.1
47.	Other endocrine disorders	251.1-259, 794.6
48.	Nutritional deficiencies	260-269, 799.4, V12.1, V77.2
49.	Fluid and electrolyte disorders	276
50.	Other metabolic and immunity disorders	270-275, 277, 278.1-279.0, 279.11-279.13, 279.2-279.9, 783.1-783.5, 783.7-783.9, 794.7, 795.7, V07.2, V12.2, V77.3-V77.9
	Diseases of the Blood and Blood-Forming Organs	
51.	Anemias	280-285, V78.0-V78.2
52.	Coagulation and hemorrhagic disorders	286, 287, V78.3
53.	Diseases of white blood cells	288
54.	Other hematologic conditions	289, 785.6, 790.0, V12.3, V58.2, V78.8-V78.9
	Mental Disorders	
55.	Organic disorders and dementias	290.0, 290.2-290.9, 293-294, 310, 331.1-331.2, 797
56.	Presenile dementia, including Alzheimer's	290.1, 331.0
57.	Alcohol-related disorders	291, 303, 305.0, 571.0-571.3, 790.3, V11.3, V79.1
58.	Drug disorders, not alcohol related	292, 304, 305.1-305.9
59.	Schizophrenic disorders	295, V11.0
60.	Other psychoses	297, 298.1-298.9, 299
61.	Depression and affective disorders	296, 298.0, 300.4, 301.12, 309.0-309.1, 311, V79.0
62.	Anxiety and personality disorders	300.0-300.3, 300.5-300.9, 301.0, 301.10-301.11, 301.13-301.19, 301.2-301.9, 307.40-307.49, 307.8, 308, 309.81, 312.3, 316, V11.1, V11.2
63.	Eating disorders and obesity	307.1, 307.5, 783.0, 783.6, 278.0
64.	Adjustment reaction	309.2-309.7, 309.82-309.9
65.	Developmental disorders	315, 317-319, V79.2-V79.3
66.	Other mental disorders (not psychoses)	302, 306, 307.0, 307.2-307.3, 307.6-307.7, 307.9, 312.0-312.2, 312.4-312.9, 313, 314, 780.1, 780.5, 799.2, V11.8-V11.9, V15.4, V40, V66.3, V67.3, V70.1-V70.2, V71.0, V79.8-V79.9
	Diseases of the Nervous System and Sense Organs	
67.	Central nervous system infection	045-049, 139.0, 320-323, V05.0
68.	Other inflammatory diseases of the central nervous system	324-326, 781.6
69.	Parkinson's disease	332
70.	Multiple sclerosis	340

See note at end of table. Source: AHCPR, Division of Provider Studies.

Appendix A—Continued
Summary diagnosis categories and ICD-9-CM codes

Category number	Diagnosis category	ICD-9-CM codes[1]
71.	Other hereditary and degenerative central nervous system diseases	330, 331.3-331.9, 333-337
72.	Paralysis	342-344, 781.4
73.	Epilepsy, convulsions	345, 780.3
74.	Headache, including migraine	346, 784.0
75.	Cataract	366
76.	Other eye disorders	360-365, 367-379, V41.0-V41.1, V42.5, V43.0-V43.1, V45.6, V52.2, V53.1, V72.0, V80.1-V80.2
77.	Otitis media and related conditions	381-383, 384.2-384.9, 385.0-385.2, 387
78.	Conditions associated with dizziness or vertigo	386, 780.4
79.	Other ear and sense organ disorders	380, 384.0-384.1, 385.3-385.9, 388-389, V41.2-V41.3, V41.5, V53.2, V72.1, V80.3
80.	Other nervous system disorders	341, 347-359, 780.0, 781.0-781.3, 781.7, 782.0, 784.3, 784.5-784.6, 792.0, 793.0, 794.0-794.1, 796.1, V12.4, V45.2, V48.4-V48.5, V49.3, V53.0, V80.0
	Disorders of the Circulatory System	
81.	Acute and chronic rheumatic disease	390-398
82.	Hypertension	401-405, 796.2, V81.1
83.	Acute myocardial infarction	410
84.	Ischemic heart disease	411-414, 786.50-786.51, 786.59, V45.81, V81.0
85.	Diseases of pulmonary circulation	415-417
86.	Other and ill-defined heart disease	420-423, 425, 429
87.	Heart valve disorders	424, 785.2-785.3, V42.2, V43.3
88.	Conduction disorders, dysrhythmias	426-427, 785.0-785.1, V45.0, V53.3
89.	Congestive heart failure	428
90.	Cerebrovascular disease	430-438
91.	Atherosclerosis (not heart or brain)	440, 443.9, 557
92.	Aneurysm and disorders of arteries	441-442, 447
93.	Peripheral arterial embolism	444
94.	Other circulatory disease	443.0-443.8, 448, 785.4-785.5, 785.9, 793.2, 794.3, 796.3, V12.5, V15.1, V42.1, V43.2, V43.4, V47.2, V71.7, V81.2
95.	Syncope	780.2
96.	Thrombophlebitis and thromboembolism	451, 453
97.	Varicose veins of lower extremity	454
98.	Hemorrhoids	455
99.	Other diseases of veins and lymphatics	452, 456.1, 456.21, 456.3-459
	Diseases of the Respiratory System	
100.	Pneumonia and influenza	480-487
101.	Other respiratory infections (not tuberculosis)	460-466, 472-476, 510, 511.1, 513
102.	Chronic obstructive pulmonary disease and allied conditions	490-492, 494, 496, 781.5, V81.3
103.	Asthma	493
104.	Aspiration pneumonitis, food/vomitus	507.0
105.	Pleurisy, pneumothorax, pulmonary collapse	511.0, 511.8-511.9, 512, 518.0-518.2, 786.52
106.	Respiratory failure/insufficiency (adult)	518.5, 518.81-518.82, 799.1, V46.1

See note at end of table. Source: AHCPR, Division of Provider Studies.

Appendix A—Continued
Summary diagnosis categories and ICD-9-CM codes

Category number	Diagnosis category	ICD-9-CM codes[1]
107.	Other lower respiratory diseases	495, 500-506, 507.1-508, 514-517, 518.3-518.4, 518.89, 519.4-519.9, 782.5, 786.0, 786.2-786.4, 786.6-786.9, 793.1, 794.2, V12.6, V42.6, V81.4
108.	Other upper respiratory diseases	471, 477-478, 519.0-519.3, 784.1, 784.4, 784.7-784.9, 786.1, V41.4, V44.0, V55.0
	Diseases of the Digestive System	
109.	Intestinal infections	001-009, V01.0, V02.0-V02.3, V03.0-V03.1, V06.0, V74.0
110.	Disorders of teeth and jaw	520-526, V52.3, V53.4, V58.5, V72.2
111.	Diseases of mouth, excluding dental	527-529, 792.4
112.	Esophageal disorders	530
113.	Gastric ulcer	531
114.	Duodenal ulcer	532
115.	Other peptic ulcer	533-534
116.	Gastritis, upper gastrointestinal obstruction, nausea	535-537, 787.0
117.	Appendicitis	540-543
118.	Inguinal hernia	550
119.	Other abdominal hernia	551-553
120.	Noninfectious enteritis and colitis	555-556, 558, 564.1, 564.5
121.	Intestinal obstruction without hernia	560, 564.7
122.	Diverticulosis and diverticulitis	562
123.	Anal and rectal conditions	564.6, 565-566, 569.0-569.4
124.	Peritonitis, intestinal abscess, and other disorders of peritoneum	567-568, 569.5
125.	Biliary tract disease	574-576, 793.3
126.	Liver disease, not alcohol related	570, 571.4-573, 782.4, 789.1, 789.5, 790.4-790.5, 794.8, V42.7
127.	Pancreas disorders (not diabetes)	577, 579.4
128.	Gastrointestinal hemorrhage	456.0, 456.20, 578
129.	Other gastrointestinal disorders	564.0, 564.2-564.4, 564.8-564.9, 569.6-569.9, 579.0-579.3, 579.5-579.9, 787.1-787.9, 789.2-789.4, 789.9, 792.1, 793.4, 793.6, V12.7, V44.1-V44.4, V45.3, V47.3, V53.5, V55.1-V55.4
130.	Abdominal pain	789.0
	Diseases of the Genitourinary System	
131.	Nephritis, nephrosis	580-583, 587-588
132.	Acute and unspecified renal failure	584, 586
133.	Chronic renal failure	585, V42.0, V45.1, V56
134.	Urinary tract infection	590, 595, 597, 598.0, 599.0, 788.1
135.	Calculus of urinary tract	592, 594, 788.0
136.	Other genitourinary disorders	589, 591, 593, 596, 598.1-598.9, 599.1-599.9, 788.2-788.9, 791.0-791.4, 791.7-791.9, 793.5, 794.4, V13.0, V41.7, V43.5, V44.5-V44.6, V47.4-V47.5, V53.6, V55.5-V55.6, V81.6
137.	Hyperplasia of prostate	600
138.	Other male genital disorders	601-608, 792.2
139.	Nonmalignant breast conditions	610-611.0, 611.2-611.3, 611.5-611.9
140.	Inflammation of female pelvic organs	614-616
141.	Endometriosis	617

See note at end of table. Source: AHCPR, Division of Provider Studies.

Appendix A—Continued
Summary diagnosis categories and ICD-9-CM codes

Category number	Diagnosis category	ICD-9-CM codes[1]
142.	Prolapse of female genital organs	618
143.	Menstrual disorders and ovarian cyst	620.0-620.2, 625.3, 626
144.	Menopausal disorders	627
145.	Infertility	628
146.	Other female genital disorders	619, 620.3-620.9, 621-624, 625.0-625.2, 625.4-625.9, 629, V13.2, V15.7, V25-26, V45.5, V55.7, V72.3
	Complications of Pregnancy, Childbirth, and the Puerperium	
147.	Pregnancy with abortive outcome	630-639, V13.1
148.	Complications during pregnancy	640-649, 760-761, 771.0-771.2, 775.0-775.3, 792.3, V23, V28, V72.4
149.	Complications of birth, puerperium	652-676, 762-763, 767-768
150.	Normal delivery/liveborn	650-651, V22, V24, V27, V30-V37, V39
	Diseases of the Skin and Subcutaneous Tissue	
151.	Skin and subcutaneous infections	680-686
152.	Other inflammatory conditions of skin	690, 694-695.3, 695.5-698
153.	Chronic ulcer of skin	707
154.	Other skin disorders	701.1-706, 709, 780.8, 782.1-782.3, 782.6-782.9, V13.3, V42.3, V82.0
	Diseases of the Musculoskeletal System and Connective Tissue	
155.	Auto-immune and connective tissue disease	135, 446, 695.4, 701.0, 710.0, 720
156.	Acquired foot deformities	700, 727.1, 734-735, 736.7
157.	Infective arthritis and osteomyelitis	711, 730
158.	Other joint disorders (not trauma)	712-713, 716.0, 716.2-716.9, 718.1-718.2, 718.5-718.9, 719.1-719.9, 726, 727.2-727.9
159.	Rheumatoid arthritis and related conditions	714, V82.1-V82.2
160.	Osteoarthritis	715, V13.4
161.	Spondylosis, intervertebral disc disorders, cervical disorders, other back pain	721-724
162.	Osteoporosis and other disorders of bone and cartilage	733
163.	Other acquired deformities	736.0-736.6, 736.8-736.9, 737.0-737.2, 737.33-737.4, 737.8-737.9, 738.1-738.9
164.	Other muscle, bone, connective tissue disease	710.1-710.9, 725, 727.0, 728-729, 731-732, 737.30-737.32, 739, 781.9, 793.7, V13.5, V42.4, V43.6-V43.7, V45.4, V48.1-V48.3, V48.6-V48.7, V49.0-V49.2, V49.4-V49.5, V53.7
	Congenital Anomalies	
165.	Congenital anomalies	740-759, V13.6, V82.3-V82.4, 795.2
	Certain Conditions Originating in the Perinatal Period	
166.	Perinatal conditions	764-766, 769-770, 771.3-771.9, 772-774, 775.4-775.9, 776-779, V13.7
	Injury and Poisoning	
167.	Joint disorders, trauma related	716.1, 717, 718.0, 718.3, 719.0, 830-839, 905.6
168.	Fracture of neck of femur (hip)	820, 905.3

See note at end of table. Source: AHCPR, Division of Provider Studies.

Appendix A—Continued
Summary diagnosis categories and ICD-9-CM codes

Category number	Diagnosis category	ICD-9-CM codes[1]
169.	Spinal cord injury, including fracture	806, 952, 907.2
170.	Other fractures, not hip	800-805, 807-819, 821-829, 905.0-905.2, 905.4-905.5, V66.4, V67.4
171.	Sprains and strains	840-848, 905.7
172.	Intracranial injury (not fracture)	850-854, 907.0
173.	Internal injury to viscera or vessels, crushing injury	860-869, 900-904, 906.4, 908.0-908.4, 925-929
174.	Open wounds	870-897, 905.8-905.9, 906.0-906.1
175.	Complication of device or procedure	909.3, 996-999, V54.0
176.	Superficial injury, contusion	910-919, 906.2-906.3, 920-924
177.	Burns	940-949, 906.5-906.9
178.	Poisoning	960-989, 909.0-909.1, 796.0, V15.6, V82.5
179.	Other external injury	907.1, 907.3-907.9, 908.5-908.9, 909.2, 909.4-909.9, 930-939, 950-951, 953-959, 990-994, 995.1-995.9, 799.0, V15.5, V71.3-V71.6
	Other and Cross-Cutting Conditions	
180.	Indications for plastic surgery	470, 611.1, 611.4, 738.0, V50, V51
181.	Allergic reactions	691-693, 708, 995.0, V07.1, V14, V15.0, V72.7
182.	Rehabilitation care and fitting of prostheses	718.4, V52.0-V52.1 V52.5-V52.9, V57
183.	Administrative/social admission	V20, V60-63, V65, V68
184.	Medical examination, evaluation	V70.0, V70.3, V70.5, V70.7-V70.8, V71.8-V71.9, V72.5, V72.8
185.	Other aftercare	V53.9, V54.8-V54.9, V55.8, V58.3-V58.4, V58.8-V58.9, V66.0, V66.5-V66.6, V66.9, V67.0, V67.51, V67.59, V67.6, V67.9

[1]Codes reflect valid ICD-9-CM codes as of October 1987.

Source: Agency for Health Care Policy and Research, Center for General Health Services Intramural Research, Division of Provider Studies.

Appendix B
Comparison of HCUP-2 national estimates with data from other sources

This appendix compares the HCUP-2 national estimates of charges and number of discharges with other sources of national data. These comparisons show that the HCUP-2 estimates are reasonably close to other estimates but are not directly comparable. The national comparisons serve as a reference for judging the utility of the primary contribution of this work—providing rankings of the costliness of specific illnesses.

Estimates of the number of discharges and charges from short-term, general-service, non-Federal hospitals in the United States with at least 30 beds in 1987, based on HCUP-2 data, are shown in Table B-1. The number of discharges is 33.7 million, and the total charges are $144.9 billion.

A basis of national comparison for hospital dollars is the estimate of community hospital inpatient revenue from the national health accounts (Levit et al., 1991) developed by the Health Care Financing Administration (HCFA). The HCFA measure is not directly comparable because it includes:

- Patient-care revenues (not patient-care charges), which should lower the HCFA estimate relative to the HCUP-2 estimate.
- Specialty (not just general) hospitals, which should raise the HCFA estimate relative to the HCUP-2 estimate.
- Nonpatient revenues (not just patient revenues), which should raise the HCFA estimate relative to the HCUP-2 estimate.

The net effect is that the HCFA estimate is lower than the HCUP-2 estimate: $133.3 billion versus $144.9 billion.

When estimates of charges based on Medicare inpatient claims are compared with HCUP-2 charges for discharges with Medicare as the expected primary payer, the HCUP-2 estimate is lower: $68.5 billion from the HCFA estimate and $63.9 billion from HCUP-2. Again, the two estimates differ in methods and definitions. For example, HCFA includes the U.S. territories and specialty hospitals certified under the Medicare program; HCUP-2 does not.

A basis of national comparison for the number of discharges is the National Hospital Discharge Survey (NHDS), conducted by the National Center for Health Statistics (Graves, 1989b). NHDS represents more hospitals than HCUP-2—for example, specialty (not just general) hospitals and hospitals with 6 or more beds (not just those with 30 or more). Thus, the 1987 estimate for all diagnoses from HCUP-2 is lower than the NHDS estimate (including newborns): 33.7 million versus 37.3 million.

Table B-2 provides estimates of the number of discharges from NHDS compared with HCUP-2 estimates and the ratio between the two estimates for the 25 most costly diagnosis categories based on principal diagnosis. On average, the HCUP-2 estimates are 10 percent lower than the NHDS estimates (a ratio of 0.9), but this varies by diagnosis category. Some of the differences in ratios between diagnosis categories can be explained by differences in the universe of hospitals: NHDS includes some specialty hospitals that would treat a different mix of patients than general hospitals would. The published NHDS estimates by diagnosis exclude newborns, resulting in the unusually high ratios of HCUP-2 estimates to NHDS estimates for complications of birth and for complications during pregnancy. NHDS reassigns the codes for acute myocardial infarction (AMI) to principal diagnosis whenever they occur with a circulatory system diagnosis code. This practice increases the number of AMIs and lowers the number of discharges with ischemic heart disease and congestive heart failure as principal diagnoses for NHDS compared with HCUP-2 data. The ratio between HCUP-2 and NHDS estimates is 1.08 for ischemic heart disease and 1.10 for congestive heart failure, but only 0.73 for AMI. Other large discrepancies between the two data sources could be the result of sampling biases. The sampling methodology for NHDS was revised for the 1988 survey, and some of the NHDS 1988 estimates (Graves, 1991) are now closer to the HCUP-2 1987 estimates than were the NHDS 1987 estimates. For example, the NHDS estimate for secondary malignancies increased from 198,000 in 1987 to 234,000 in 1988, resulting in a ratio with 1987 HCUP-2 data of 1.25 for 1987 and 1.06 for 1988. Similarly, the estimate for cancer of the bronchus, lung, trachea, and larynx was 298,000 in 1987 and 233,000 in 1988, for an increase in the ratio with 1987 HCUP-2 estimates from 0.63 to 0.81.

Table B-1
Comparison of HCUP-2 national estimates with estimates from other sources, 1987

Type of estimate	HCUP-2 discharge abstract measure	HCUP-2 estimate in millions	Comparison source: measure	Comparison estimate in millions
Number of discharges (including newborns): U.S.	Discharges from short-term (ALOS <30 days), general, non-Federal hospitals with 30 or more beds in 50 States and DC (based on weighted HCUP-2 data)	33.7	NHDS: Discharges from short-term (ALOS <30 days), general and specialty, non-Federal hospitals with 6 or more beds in 50 States and DC (Graves, 1989b)	37.3
Number of discharges: Medicare	Discharges from short-term (ALOS <30 days), general, non-Federal hospitals with 30 or more beds in 50 States and DC with Medicare as expected primary payer (based on weighted HCUP-2 data)	10.3	HCFA: Discharges from short-term (ALOS <25 days), general and specialty, Federal and non-Federal, Medicare-certified hospitals in the 50 States, DC, and territories; excluding HMO enrollees; based on 20 percent of Medicare inpatient claims (Latta and Keene, 1990)	10.1
Inpatient hospital charges: U.S.	Total inpatient billed charges from short-term (ALOS <30 days), general, non-Federal hospitals with 30 or more beds in 50 States and DC (based on weighted HCUP-2 data)	$144,879	Not available	—
Inpatient hospital revenues: U.S.	Not available	—	HCFA: Inpatient revenue from short-term (ALOS <30 days), general and specialty (excluding psychiatric and chemical dependency), non-Federal hospitals in the 50 States, DC, and territories; based on AHA Annual Survey including nonpatient revenue (Levit et al., 1991)	$133,335
Inpatient hospital expenses: U.S.	Not available	—	HCFA: Inpatient expenses for short-term, general, non-Federal (community) hospitals in the 50 States and DC; based on data from the AHA Panel Survey, consisting of a sample of about 1/3 of community hospitals in the 50 States and DC (Donham et al., 1991)	$129,824

See note at end of table.

Table B-1—Continued
Comparison of HCUP-2 national estimates with estimates from other sources, 1987

Type of estimate	HCUP-2 discharge abstract measure	HCUP-2 estimate in millions	Comparison source: measure	Comparison estimate in millions
Inpatient hospital charges: Medicare	Inpatient charges from short-term (ALOS <30 days), general, non-Federal hospitals with 30 or more beds in 50 States and DC billed for discharges with Medicare as expected primary payer (based on weighted HCUP-2 data)	$63,928	HCFA: Inpatient charges from short-term (ALOS <25 days), general and specialty, Federal and non-Federal, Medicare-certified hospitals in the 50 States, DC, and territories billed to Medicare; excluding HMO enrollees; based on 20 percent of Medicare inpatient claims (Latta and Keene, 1990)	$68,490
Inpatient hospital payments: Medicare	Not available	—	HCFA: Inpatient Medicare payments to short-term (ALOS <25 days), general and specialty, Federal and non-Federal, Medicare-certified hospitals in the 50 States, DC, and territories; excluding HMO enrollees; based on 20 percent of Medicare inpatient claims (Latta and Keene, 1990)	$44,068
Inpatient hospital charges: Medicaid	Inpatient charges from short-term (ALOS <30 days), general, non-Federal hospitals with 30 or more beds in 50 States and DC billed for discharges with Medicaid as expected primary payer (based on weighted HCUP-2 data)	$13,650	Not available	—
Inpatient hospital payments: Medicaid	Not available	—	HCFA: Inpatient Medicaid payments made in fiscal year 1987 to short-term, general and specialty (excluding psychiatric), Federal and non-Federal, Medicaid-certified hospitals in 50 States and DC; excluding HMO enrollees (HCFA, no date)	$11,243

Note: AHA is American Hospital Association. ALOS is average length of stay. HCFA is Health Care Financing Administration. HCUP-2 is Hospital Cost and Utilization Project, 1980-87. HMO is health maintenance organization. NHDS is National Hospital Discharge Survey.

Sources Used for Comparison of HCUP-2 Estimates in Table B-1

National Hospital Discharge Survey—Number of Discharges: United States

SOURCE OF DATA: Graves (1989b). The data reported are for calendar year 1987. The National Hospital Discharge Survey is an annual survey of hospitals conducted by the National Center for Health Statistics. The universe of hospitals sampled in 1987 consisted of 6,007 short-stay (average length of stay less than 30 days), special and general, non-Federal, noninstitutional hospitals with six beds or more in the 50 States and the District of Columbia. The specialty hospitals include obstetrics-gynecology, ear-nose-throat, orthopedic, and children's. The sample consists of 400 hospitals and approximately 181,000 abstracts.

Health Care Financing Administration—Number of Discharges: Medicare

SOURCE OF DATA: Latta and Keene (1990). The data reported are for discharges in calendar year 1987. The data, derived from the Health Care Financing Administration (HCFA) short-stay hospital inpatient stay record file, are based on a 20-percent sample of inpatient stay records received and processed by HCFA by December 1989. The data include inpatient hospital discharges for Medicare beneficiaries in the 50 States, the District of Columbia, and territories in general-service or specialty hospitals certified as participating facilities under Medicare and reporting an average length of stay less than 25 days. The Medicare inpatient files do not contain information on hospital stays for beneficiaries enrolled in health maintenance organizations (HMOs) operating under a Medicare risk contract. (According to the Health Care Financing Administration (1990), approximately 3.3 percent of elderly Medicare beneficiaries were enrolled in HMOs in 1986.)

Health Care Financing Administration—Inpatient Hospital Revenues: United States

SOURCE OF DATA: Levit et al. (1991). This measure is a component of the National Health Accounts developed by HCFA. The data cover non-Federal acute care hospitals in the 50 States, the District of Columbia, and territories with an average length of stay less than 30 days, excluding psychiatric, alcohol, and other chemical dependency hospitals. HCFA's description of the National Health Accounts (*Health Care Financing Review,* 1990) indicates that the estimates for revenues are imputed based on expenses reported in the American Hospital Association (AHA) Annual Survey, using aggregate revenue-to-expense ratios provided by AHA. Then the revenues are converted (imputed) from the hospital's accounting year to the calendar year. The AHA Panel Survey hospitals (approximately one-third of the community hospitals in the AHA Annual Survey) are used for this conversion. Imputations are made to account for missing periods or overlapping periods in the reporting. The revenue includes nonpatient operating revenue (e.g., gift shops and parking lots) and nonoperating revenues such as interest income and contributions.

Health Care Financing Administration—Inpatient Hospital Expenses: United States

SOURCE OF DATA: Donham et al. (1991). The data are based on AHA Panel Survey monthly data for calendar year 1987. This survey includes a sample of approximately one-third of the community hospitals in the AHA Annual Survey. These hospitals are short-term, general and specialty, non-Federal hospitals in the 50 States and the District of Columbia with an average length of stay less than 30 days.

Health Care Financing Administration—Inpatient Hospital Charges: Medicare

SOURCE OF DATA: Latta and Keene (1990). The data are for calendar year 1987. The data, derived from the HCFA short-stay hospital inpatient stay record file, are based on a 20-percent sample of inpatient stay records received and processed by HCFA by December 1989. The data include charges for inpatient hospital services for Medicare beneficiaries in the 50 States, the District of Columbia, and territories in general-service or specialty hospitals certified as participating Federal and non-Federal facilities under Medicare and reporting an average length of stay less than 25 days. The Medicare inpatient files do not contain information on hospital stays for beneficiaries enrolled in an HMO operating under a Medicare risk contract.

Health Care Financing Administration—Inpatient Hospital Payments: Medicare

SOURCE OF DATA: Latta and Keene (1990). The data are for calendar year 1987. The data are for Medicare payments to hospitals, which are not the same as charges. In addition to the comments about Medicare data listed for Medicare inpatient charges, note that Medicare payments for short-stay hospital services are subject to (1) a deductible of $520 in 1987 for inpatient hospital services provided for a spell of illness and (2) coinsurance of $130 a day in 1987 for hospital services of more than 61 days during the spell of illness.

Health Care Financing Administration—Inpatient Hospital Payments: Medicaid

SOURCE OF DATA: Health Care Financing Administration (no date). States report aggregate statistics regarding their Medicaid programs annually to HCFA on Form 2082. The statistic in the table was obtained from unpublished HCFA tables presenting the Form 2082 information reported by each State for fiscal year 1987. It includes all 50 States and the District of Columbia but not U.S. territories. The statistic is for short-term, general and specialty (except psychiatric), Federal and non-Federal hospitals that are Medicaid certified. HMO enrollees are excluded. The data are for payments made in fiscal year 1987, not necessarily for services provided in fiscal year 1987.

Table B-2
Comparison of HCUP-2 national estimates with NHDS estimates of number of discharges, by top 25 summary diagnosis categories, 1987

Rank by charges		Summary diagnosis category[1]	HCUP-2 discharges in thousands	NHDS discharges in thousands	Ratio of HCUP-2 estimate to NHDS estimate
		All diagnoses	**33,713**	**37,298**	**0.90**
1	84.	Ischemic heart disease	1,604	1,491	1.08
2	150.	Normal delivery/liveborn	4,383	3,958	1.11
3	90.	Cerebrovascular disease	816	894	0.91
4	100.	Pneumonia and influenza	887	953	0.93
5	149.	Complications of birth, puerperium	2,231	176	12.68
6	83.	Acute myocardial infarction	555	760	0.73
7	89.	Congestive heart failure	694	629	1.10
8	170.	Other fractures, not hip	779	810	0.96
9	175.	Complication of device or procedure	500	464	1.08
10	125.	Biliary tract disease	579	636	0.91
11	88.	Conduction disorders, dysrhythmias	496	583	0.85
12	161.	Spondylosis, intervertebral disc disorders, cervical disorders, other back pain	680	846	0.80
13	168.	Fracture of neck of femur (hip)	264	253	1.05
14	61.	Depression and affective disorders	455	523	0.87
15	101.	Other respiratory infections (not tuberculosis)	682	769	0.89
16	160.	Osteoarthritis	206	231	0.89
17	46.	Diabetes mellitus	381	489	0.78
18	38.	Secondary malignancies	247	198	1.25
19	57.	Alcohol-related disorders	415	484	0.86
20	148.	Complications during pregnancy	913	89	10.26
21	12.	Cancer of colon-rectum	161	196	0.82
22	134.	Urinary tract infection	373	428	0.87
23	16.	Cancer of bronchus, lung, trachea, larynx	188	298	0.63
24	121.	Intestinal obstruction without hernia	215	223	0.96
25	2.	Septicemia	162	172	0.94

[1] Diagnoses classified according to Clinical Classifications for Health Policy Research summary diagnosis categories (Elixhauser, Andrews, and Fox, 1993).

Note: HCUP-2 is Hospital Cost and Utilization Project, 1980-87. NHDS is National Hospital Discharge Survey.

Source Used for Comparison of HCUP-2 Estimates in Table B-2

National Hospital Discharge Survey—Number of Discharges

SOURCE OF DATA: Graves (1989a). The data reported are for calendar year 1987. The National Hospital Discharge Survey is an annual survey of hospitals conducted by the National Center for Health Statistics (NCHS). The universe of hospitals sampled in 1987 was 6,007 short-stay (average length of stay less than 30 days) special and general, non-Federal, noninstitutional hospitals with six beds or more in the 50 States and the District of Columbia. The specialty hospitals include obstetrics-gynecology, ear-nose-throat, orthopedic, and children's. The sample consists of 400 hospitals and approximately 181,000 abstracts.

NCHS makes some changes to the principal diagnosis on discharge abstracts. Whenever a diagnosis code for acute myocardial infarction (AMI) is on an abstract with other circulatory system diagnoses but is not listed as the principal diagnosis, NCHS assigns AMI as the principal diagnosis. Also, there is a list of codes that, in accordance with standard medical coding practice, NCHS specifies cannot be listed first. The publication that provides statistics by diagnosis does not include newborn infants.

Provider Studies Research Notes

No.	Title (Author) and Order Number	Date
1	Project Overview (Hornbrook) NTIS Accession No. PB84-111566	June 1983
2	Patients in Public General Hospitals: Who Pays, How Sick? (Coffey) PHS Pub. No. 83-3344	Sept. 1983
3	Characteristics of Financially Distressed Hospitals (Kelly and O'Brien) NTIS Accession No. PB84-111574	June 1983
4	Who Receives Cesareans: Patient and Hospital Characteristics (Goldfarb) NTIS Accession No. PB85-124766	Sept. 1984
5	Sole Community Hospitals: Are They Different? (Farley) PHS Pub. No. 85-3348	Mar. 1985
6	Utilization of Hospital Inpatient Services by Elderly Americans (Garnick and Short) PHS Pub. No. 85-3351	June 1985
7	Competition Among Hospitals: Market Structure and Its Relation to Utilization, Costs, and Financial Position (Farley) PHS Pub. No. 85-3353	Aug. 1985
8	Use of Short-Term General Hospitals by Patients With Psychiatric Diagnoses (Wallen) PHS Pub. No. 86-3395	Oct. 1985
9	Case Mix and Treatment Patterns of Medicaid and Privately Insured Psychiatric Patients in Short-Term General Hospitals (Wallen) PHS Pub. No. 87-3402	Oct. 1986
10	HCUP-2 Project Overview (Coffey and Farley) PHS Pub. No. 88-3428	July 1988
11	Trends in Hospital Average Lengths of Stay, Casemix, and Discharge Rates, 1980-85 (Farley) PHS Pub. No. 88-3420	Apr. 1988
12	Urban and Rural Hospital Costs: 1981-85 (Hogan) PHS Pub. No. 88-3419	Apr. 1988
13	The 50 Most Frequent Diagnosis-Related Groups (DRGs), Diagnoses, and Procedures: Statistics by Hospital Size and Location (Lemrow and others) PHS Pub. No. 90-3465	Sept. 1990
14	Financially Distressed Hospitals: A Profile of Behavior Before and After PPS (Rizzo) PHS Pub. No. 90-3467	Sept. 1990
15	AIDS in U.S. Hospitals, 1986-87: A National Perspective (Ball and Turner) AHCPR Pub. No. 91-0015	July 1991
16	Pediatric AIDS-Related Discharges in a Sample of U.S. Hospitals: Demographics, Diagnoses, and Resource Use (Ball and Thaul) AHCPR Pub. No. 92-0031	Feb. 1992
17	Clinical Classifications for Health Policy Research: Discharge Statistics by Principal Diagnosis and Procedure (Elixhauser and others) AHCPR Pub. No. 93-0043	Aug. 1993
18	Intermittent Positive Pressure Breathing: Old Technologies Rarely Die (Duffy and Farley) AHCPR Pub. No. 94-0001	Dec. 1993
19	The National Bill for Diseases Treated in U.S. Hospitals: 1987 (Andrews and others) AHCPR Pub. No. 94-0002	Feb. 1994

Research Notes 1, 3, and 4 are available from the National Technical Information Service (NTIS), Springfield, VA 22161; telephone (703) 487-4650. Single copies of all other publications are available from the AHCPR Publications Clearinghouse, P.O. Box 8547, Silver Spring, MD 20907; telephone 800-358-9295.

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